Keysight X-Series Signal Analyzers

This manual provides documentation for the following Analyzers:

MXA Signal Analyzer N9020A
EXA Signal Analyzer N9010A

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N9077A - XFP Single Acquisition Combined WLAN Measurement Application User's and Programmer's Reference

KEYSIGHT TECHNOLOGIES

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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.

1 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 its usability.

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

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

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

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

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

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

C:\Programing Files\Agilent\Licensing

You may want to keep a copy of your license key in a secure location. To do this, you can print out a copy of the display showing the license numbers. If you should lose your license key, call your nearest 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. To obtain your license key, follow the instructions that accompany the certificate.

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

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

C:\Programming Files\Agilent\Licensing

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

Updating Measurement Application Software

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

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

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

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

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

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

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

You can 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

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

1. Browse to one of the following URLs, according to the product name of your analyzer:

   www.agilent.com/find/cxa

   www.agilent.com/find/exa

   www.agilent.com/find/mxa

   www.agilent.com/find/pxa

2. The home page for your instrument appears (in some cases, you may see an initial splash screen containing a button named View the Webpage, which you should click to display the home page).

3. Locate the Options tab, as highlighted in the example below, which shows the home page for the MXA.

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

Front-Panel Features

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

Getting Started Guide

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

Display Annotations

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

Getting Started Guide

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

Rear-Panel Features

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

Getting Started Guide

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

Instrument Security & Memory Volatility

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

For the X Series analyzers, this information is contained in the document "Security Features and Certificate of Volatility". This document is **not** included in the Documentation CD, or the instrument's on-disk library, but it may be downloaded from Agilent's web site.

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

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

To locate and download the document, select Model Number "N9020A", then click "Submit". Then, follow the on-screen instructions to download the file.

2 About the Single Acquisition Combined WLAN Measurement Application

This chapter describes Single Acquisition Combined WLAN measurements made by the analyzer.

What Does the Single Acquisition Combined WLAN Measurement Application Do?

Single Acquisition Combined WLAN adopts the concept of SACM (Single Acquisition Combined Measurements). It performs as many measurements as possible on one capture.

Combined Measurement is capture centered, whereas a traditional measurement is measurement centered. In other words, in a combined measurement, all the measurements are based on one capture, and there is no switch time between different measurements. In a traditional measurement, measurement controls the capture activity; the capture restarts when the measurement is changed.

The Combined WLAN Measurement Application includes one measurement, Combined WLAN, which provides the following measurement results:

- Transmit Power
- Transmit Output Spectrum
- Modulation Accuracy

3 Programming the Analyzer

This section 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:\Program Files\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.

Resource	Description
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 instrument's Status Register Subsystem is fully detailed in the section "STATus Subsystem" (under the chapter "Introduction to Programming X-Series Applications") of the document:

X Series Programmer's Guide

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

Common Commands

All

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

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

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

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

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

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

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

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

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

Status Bits/OPC dependencies	Bits 11, 12, or 14 may be set in the Status Questionable Calibration register.
Initial S/W Revision	Prior to A.02.00

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

Clear Status

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

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

Backwards Compatibility Notes	In general the status bits used in the X-Series status system will be backwards compatible with ESA and PSA. However, note that all conditions will generate events that go into the event log, and some will also generate status bits.
Initial S/W Revision	Prior to A.02.00

Standard Event Status Enable

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

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

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

Standard Event Status Register Query

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

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

Identification Query

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

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

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
Initial 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.
Status Bits/OPC dependencies	Not global to all remote ports or front panel. *OPC only considers operation that was initiated on the same port as the *OPC command was issued from. *OPC is an overlapped command, but *OPC? is sequential.
Backwards Compatibility Notes	1. The ESA/PSA/VSA products do not meet all the requirements for the *OPC command specified by IEEE 488.2. This is corrected for X-Series. This will sometimes cause behavior that is not backward compatible, but it will work as customers expect. 2. Commands such as, *OPC/*OPC?/*WAI/*RST used to be global. They considered front panel operation in conjunction with the GPIB functionality. Now they are evaluated on a per channel basis. That is, the various rear panel remote ports and the front panel i/o are all considered separately. Only the functionality initiated on the port where the *OPC was sent, is considered for its operation. 3. *OPC used to hold off until the operation bits were cleared. Now it holds off until all overlapping commands are completed. Also, earlier instruments did not wait for completion of all processes, only the ones identified here (in the STATus:OPERation register): Calibrating: monitored by PSA, ESA, VSA (E4406A) Sweeping: monitored by PSA, ESA, VSA (E4406A) Waiting for Trigger: monitored by PSA, ESA, VSA (E4406A) Measuring: monitored by PSA and ESA (but not in all Modes). Paused: monitored by VSA (E4406A). Printing: monitored by VSA (E4406A). Mass memory busy: monitored by VSA (E4406A).
Initial 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 SA products and software. So, the actual implementation will use arbitrary ascii. But quotes will be sent as the first and last ascii characters that are sent with the comma-separated option list.

Remote Command	`*OPT?`
Initial S/W Revision	Prior to A.02.00

Recall Instrument State

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

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

*RST (Remote Command Only)

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

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

Save Instrument State

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

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

Service Request Enable

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

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

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

Status Byte Query

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

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

Trigger

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

Key Path	No equivalent key. See related keys Single and Restart.
Remote Command	`*TRG`

Example	*TRG Triggers the instrument to take a sweep or start a measurement, depending on the current instrument settings.
Notes	See related command :INITiate:IMMediate.
Initial S/W Revision	Prior to A.02.00

Self Test Query

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

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

Wait-to-Continue

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

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

4 Combined WLAN

Table of Contents

List of SCPI Commands

* A B C D E F G H I J K L M N O P Q R S T U V W X Y Z

*

```
*CAL?
```

C

```
CALCulate:CWLan:EVM:BURSt:THReshold:LOWer <ampl>, ...
CALCulate:CWLan:EVM:BURSt:THReshold:LOWer?
CALCulate:CWLan:EVM:BURSt:THReshold:UPPer <ampl>, ...
CALCulate:CWLan:EVM:BURSt:THReshold:UPPer?
CALCulate:CWLan:TOSPectrum:LIMit:DATA <rel_ampl>, ...
CALCulate:CWLan:TOSPectrum:LIMit:DATA?
CALibration[:ALL]
CALibration[:ALL]?
CALibration:AUTO ON | PARTial | OFF
CALibration:AUTO ALERt
CALibration:AUTO?
CALibration:AUTO:ALERt TTEMperature | DAY | WEEK | NONE
CALibration:AUTO:ALERt?
CALibration:AUTO:MODE ALL | NRF
CALibration:AUTO:MODE?
CALibration:AUTO:TIME:OFF?
CALibration:DATA:BACKup <filename>
CALibration:DATA:DEFault
CALibration:DATA:RESTore <filename>
CALibration:FREQuency:REFerence:COARse
CALibration:FREQuency:REFerence:COARse <integer>
CALibration:FREQuency:REFerence:COARse?
CALibration:FREQuency:REFerence:FINE <integer>
CALibration:FREQuency:REFerence:FINE?
CALibration:FREQuency:REFerence:MODE CALibrated | USER
CALibration:FREQuency:REFerence:MODE?
CALibration:NRF
CALibration:NRF?
CALibration:RF
CALibration:RF?
```

```
CALibration:RFPSelector:ALERt ON | OFF | 0 | 1
CALibration:RFPSelector:ALERt?
CALibration:RFPSelector:CONDucted
CALibration:RFPSelector:CONDucted?
CALibration:RFPSelector:FULL
CALibration:RFPSelector:FULL?
CALibration:RFPSelector:RADiated
CALibration:RFPSelector:RADiated?
CALibration:RFPSelector:SCHeduler:RECurrence DAY | WEEK | OFF
CALibration:RFPSelector:SCHeduler:RECurrence?
CALibration:RFPSelector:SCHeduler:RECurrence:DAY SUN | MON |
TUE | WED | THU | FRI | SAT
CALibration:RFPSelector:SCHeduler:RECurrence:DAY?
CALibration:RFPSelector:SCHeduler:RECurrence:WEEK <integer>
CALibration:RFPSelector:SCHeduler:RECurrence:WEEK?
CALibration:RFPSelector:SCHeduler:STATe ON | OFF | 0 | 1
CALibration:RFPSelector:SCHeduler:STATe?
CALibration:RFPSelector:SCHeduler:TASK T1 | T2 | T3
CALibration:RFPSelector:SCHeduler:TASK?
CALibration:RFPSelector:SCHeduler:TIME:NEXT?
CALibration:RFPSelector:SCHeduler:TIME:STARt "date", "time"
CALibration:RFPSelector:SCHeduler:TIME:STARt?
CALibration:SOURce:STATe OFF | ON | 0 | 1
CALibration:SOURce:STATe?
CALibration:TEMPerature:CURRent?
CALibration:TEMPerature:LALL?
CALibration:TEMPerature:LPReselector?
CALibration:TEMPerature:LRF?
CALibration:TEMPerature:RFPSelector:LCONducted?
CALibration:TEMPerature:RFPSelector:LRADiated?
CALibration:TIME:LALL?
CALibration:TIME:LPReselector?
CALibration:TIME:LRF?
CALibration:TIME:RFPSelector:LCONducted?
CALibration:TIME:RFPSelector:LRADiated?
CALibration:YTF
CALibration:YTF?
CONFigure:CWLan
COUPle ALL | NONE
```

D

```
DISPlay:<measurement>:ANNotation:TITLe:DATA <string>
DISPlay:<measurement>:ANNotation:TITLe:DATA?
DISPlay:ACTivefunc[:STATe] ON | OFF | 1 | 0
DISPlay:ACTivefunc[:STATe]?
DISPlay:ANNotation:MBAR[:STATe] OFF | ON | 0 | 1
DISPlay:ANNotation:MBAR[:STATe]?
DISPlay:ANNotation:SCReen[:STATe] OFF | ON | 0 | 1
DISPlay:ANNotation:SCReen[:STATe]?
DISPlay:BACKlight ON | OFF
DISPlay:BACKlight?
DISPlay:BACKlight:INTensity <integer>
DISPlay:BACKlight:INTensity?
DISPlay:CWLan:VIEW[:SELect]
DISPlay:CWLan:VIEW[:SELect]?
DISPlay:ENABle OFF | ON | 0 | 1
DISPlay:ENABle?
DISPlay:WINDow[1]:ANNotation[:ALL] OFF | ON | 0 | 1
DISPlay:WINDow[1]:ANNotation[:ALL]?
DISPlay:WINDow[1]:TRACe:GRATicule:GRID[:STATe] OFF | ON | 0 |
1
DISPlay:WINDow[1]:TRACe:GRATicule:GRID[:STATe]?
DISPlay:WINDow:FORMat:TILE
DISPlay:WINDow:FORMat:ZOOM
DISPlay:WINDow[:SELect] <number>
DISPlay:WINDow[:SELect]?
```

G

```
GLOBal:DEFault
GLOBal:FREQuency:CENTer[:STATe] 1 | 0 | ON | OFF
GLOBal:FREQuency:CENTer[:STATe]?
```

H

```
HCOPy:ABORt
HCOPy[:IMMediate]
```

I

```
INITiate:CONTinuous OFF | ON | 0 | 1
```

```
INITiate:CONTinuous?
INITiate[:IMMediate]
INITiate:RESTart
INPut:COUPling AC | DC
INPut:COUPling?
INPut:MIXer EXTernal | INTernal
INPut:MIXer?
INSTrument:CATalog?
INSTrument:COUPle:DEFault
INSTrument:COUPle:FREQuency:CENTer ALL | NONE
INSTrument:COUPle:FREQuency:CENTer?
INSTrument:DEFault
INSTrument:NSELect <integer>
INSTrument:NSELect?
INSTrument[:SELect] 'SA' | 'PNOISE' | 'EDGE' | 'GSM' |
'BASIC'
INSTrument[:SELect] SANalyzer
INSTrument[:SELect] RECeiver
INSTrument[:SELect] GSM
INSTrument[:SELect] SA | SEQAN | EMI | BASIC | WCDMA |
EDGEGSM | WIMAXOFDMA | VSA | PNOISE | NFIGURE | ADEMOD | BT |
TDSCDMA | CDMA2K | CDMA1XEV | LTE | LTETDD | DVB | DTMB |
DCATV | ISDBT | CMMB | CWLAN | CWIMAXOFDM | WIMAXFIXED | IDEN
| RLC | SCPILC | VSA89601
INSTrument[:SELect]?
INST:SEL EMI:CONFFSC
INST:SEL SCPILC
```

L

```
LXI:EVENt:LOG:ALL?
LXI:EVENt:LOG:CIRCular[:ENABle] ON | OFF | 1 | 0
LXI:EVENt:LOG:CIRCular[:ENABle]?
LXI:EVENt:LOG:CIRCular:FBENtry
LXI:EVENt:LOG:CLEar
LXI:EVENt:LOG:COUNt?
LXI:EVENt:LOG:ENABle ON | OFF | 1 | 0
LXI:EVENt:LOG:ENABle?
LXI:EVENt:LOG:ENTRy? <intIndex>
LXI:EVENt:LOG[:NEXT]?
```

```
LXI:EVENt:LOG:SIZE <size>
LXI:EVENt:LOG:SIZE?
LXI:EVENt[:OUTPut]:LAN:DISable:ALL
LXI:EVENt[:OUTPut]:LAN[:SET]:DRIVe "LANEVENT", OFF | NORMal |
WOR
LXI:EVENt[:OUTPut]:LAN[:SET]:DRIVe? "LANEVENT"
LXI:EVENt[:OUTPut]:LAN[:SET]:ENABled "LANEVENT", ON | OFF | 1
| 0
LXI:EVENt[:OUTPut]:LAN[:SET]:ENABled? "LANEVENT"
LXI:EVENt[:OUTPut]:LAN[:SET]:SLOPe "LANEVENT", POSitive |
NEGative
LXI:EVENt[:OUTPut]:LAN[:SET]:SLOPe? "LANEVENT"
LXI:EVENt[:OUTPut]:LAN[:SET]:SOURce "LANEVENT", "SourceEvent"
LXI:EVENt[:OUTPut]:LAN[:SET]:SOURce? "LANEVENT"
```

M

```
MEMMory:RDIRectory <directory_name>
MMEMory:CATalog? [<directory_name>]
MMEMory:CDIRectory [<directory_name>]
MMEMory:CDIRectory?
MMEMory:COPY <string>, <string>[, <string>, <string>]
MMEMory:DATA <file_name>, <data>
MMEMory:DATA? <file_name>
MMEMory:DELete <file_name>[, <directory_name>]
MMEMory:LOAD:CORRection 1 | 2 | 3 | 4 | 5 | 6, <filename>
MMEMory:LOAD:CORRection ANTenna | CABLe | OTHer | USER,
<filename>
MMEMory:MDIRectory <directory_name>
MMEMory:MOVE <string>, <string>[, <string>, <string>]
MMEMory:STORe:RESults:MTABle|PTABle|SPECtrogram <filename>
MMEMory:STORe:SCReen:THEMe TDColor | TDMonochrome | FCOLor |
FMONochrome
MMEMory:STORe:SCReen:THEMe?
```

N

```
Note thataftersendingthis,
thequery[:SENSe]:FEED?willNOTreturn"AREF"butinsteadthecurrentlyselecte
```

O

```
OUTPut:ANALog OFF | SVIDeo | LOGVideo | LINVideo | DAUDio
OUTPut:ANALog?
OUTPut:ANALog:AUTO OFF | ON | 0 | 1
OUTPut:ANALog:AUTO?
OUTPut:DBUS[1][:STATe] ON | OFF | 1 | 0
OUTPut:DBUS[1][:STATe]?
```

S

```
[:SENSe]:<measurement>:TRIGger:SOURce
[:SENSe]:<measurement>:TRIGger:SOURce IF
[:SENSe]:ACPR:TRIGger:SOURce
[:SENSe]:CORRection:BTS[:RF]:GAIN <rel_ampl>
[:SENSe]:CORRection:BTS[:RF]:GAIN?
[:SENSe]:CORRection:BTS[:RF]:LOSS <rel_ampl>
[:SENSe]:CORRection:BTS[:RF]:LOSS?
[:SENSe]:CORRection:CSET[1]...6:DATA <freq>, <ampl>, ...
[:SENSe]:CORRection:CSET[1]...6:DATA?
[:SENSe]:CORRection:IMPedance[:INPut][:MAGNitude] 50 | 75
[:SENSe]:CORRection:IMPedance[:INPut][:MAGNitude]?
[:SENSe]:CORRection:MS[:RF]:GAIN <rel_ampl>
[:SENSe]:CORRection:MS[:RF]:GAIN?
[:SENSe]:CORRection:MS[:RF]:LOSS <rel_ampl>
[:SENSe]:CORRection:MS[:RF]:LOSS?
[:SENSe]:CORRection:OFFSet[:MAGNitude]
[:SENSe]:CORRection:SA[:RF]:GAIN <rel_ampl>
[:SENSe]:CORRection:SA[:RF]:GAIN?
[:SENSe]:CWLan:CAPTure:ATUNcertain <time>
[:SENSe]:CWLan:CAPTure:ATUNcertain?
[:SENSe]:CWLan:CAPTure:BURSt:ATTenuation <rel_ampl>, ...
[:SENSe]:CWLan:CAPTure:BURSt:ATTenuation?
[:SENSe]:CWLan:CAPTure:BURSt:FREQuency <freq>, ...
[:SENSe]:CWLan:CAPTure:BURSt:FREQuency?
[:SENSe]:CWLan:CAPTure:BURSt:GATE:SOURce <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>
```

```
[:SENSe]:CWLan:CAPTure:BURSt:GATE:SOURce?
[:SENSe]:CWLan:CAPTure:BURSt:LOAD <time>, ...
[:SENSe]:CWLan:CAPTure:BURSt:LOAD?
[:SENSe]:CWLan:CAPTure:BURSt:NUMBer <integer>
[:SENSe]:CWLan:CAPTure:BURSt:NUMBer?
[:SENSe]:CWLan:CAPTure:BURSt:PREFix <time>, ...
[:SENSe]:CWLan:CAPTure:BURSt:PREFix?
[:SENSe]:CWLan:CAPTure:BURSt:SUFFix <time>, ...
[:SENSe]:CWLan:CAPTure:BURSt:SUFFix?
[:SENSe]:CWLan:CAPTure:BURSt:TYPE STATic | DYNamic
[:SENSe]:CWLan:CAPTure:BURSt:TYPE?
[:SENSe]:CWLan:CAPTure:OFFSet <time>
[:SENSe]:CWLan:CAPTure:OFFSet?
[:SENSe]:CWLan:EVM:BURSt:STARt <integer>
[:SENSe]:CWLan:EVM:BURSt:STARt?
[:SENSe]:CWLan:EVM:BURSt:STOP <integer>
[:SENSe]:CWLan:EVM:BURSt:STOP?
[:SENSe]:CWLan:EVM:DEMod AUTO | BPSK | QPSK | QAM16 | QAM64 |
QAM256
[:SENSe]:CWLan:EVM:DEMod?
[:SENSe]:CWLan:EVM[:ENABle] OFF | ON | 0 | 1
[:SENSe]:CWLan:EVM[:ENABle]?
[:SENSe]:CWLan:EVM:EQUalizer:TRAining SEQ | SDATa
[:SENSe]:CWLan:EVM:EQUalizer:TRAining?
[:SENSe]:CWLan:EVM:FILTer:ALPHa <real>
[:SENSe]:CWLan:EVM:FILTer:ALPHa?
[:SENSe]:CWLan:EVM:FILTer:MEASurement NONE | RRCosine
[:SENSe]:CWLan:EVM:FILTer:MEASurement?
[:SENSe]:CWLan:EVM:FILTer:REFerence GAUSsian | RECTangle |
RCOSine
[:SENSe]:CWLan:EVM:FILTer:REFerence?
[:SENSe]:CWLan:EVM:GINTerval:RATio R1BY8 | R1BY4 | HTS
[:SENSe]:CWLan:EVM:GINTerval:RATio?
[:SENSe]:CWLan:EVM:NFFT <integer>
[:SENSe]:CWLan:EVM:NFFT?
[:SENSe]:CWLan:EVM:SPECtrum NORMal | INVert
[:SENSe]:CWLan:EVM:SPECtrum?
[:SENSe]:CWLan:EVM:SUBCarrier:NUMBer <integer>
[:SENSe]:CWLan:EVM:SUBCarrier:NUMBer?
[:SENSe]:CWLan:EVM:SUBCarrier:SELect ALL | PILot | SINGle
```

[:SENSe]:CWLan:EVM:SUBCarrier:SELect?
[:SENSe]:CWLan:EVM:TADJust <percent>
[:SENSe]:CWLan:EVM:TADJust?
[:SENSe]:CWLan:EVM:TIME:INTerval <integer>
[:SENSe]:CWLan:EVM:TIME:INTerval?
[:SENSe]:CWLan:EVM:TIME:OFFSet <integer>
[:SENSe]:CWLan:EVM:TIME:OFFSet?
[:SENSe]:CWLan:EVM:TIME:RESult:LENGth <integer>
[:SENSe]:CWLan:EVM:TIME:RESult:LENGth?
[:SENSe]:CWLan:EVM:TIME:RESult:MAX <integer>
[:SENSe]:CWLan:EVM:TIME:RESult:MAX?
[:SENSe]:CWLan:EVM:TIME:RESult[:STATe]:AUTO OFF | ON | 0 | 1
[:SENSe]:CWLan:EVM:TIME:RESult[:STATe]:AUTO?
[:SENSe]:CWLan:EVM:TRACk:AMP OFF | ON | 0 | 1
[:SENSe]:CWLan:EVM:TRACk:AMP?
[:SENSe]:CWLan:EVM:TRACk:PHASe OFF | ON | 0 | 1
[:SENSe]:CWLan:EVM:TRACk:PHASe?
[:SENSe]:CWLan:EVM:TRACk:TIMing OFF | ON | 0 | 1
[:SENSe]:CWLan:EVM:TRACk:TIMing?
[:SENSe]:CWLan:IF:GAIN:AUTO[:STATe] OFF | ON | 0 |
1[:SENSe]:CWLan:IF:GAIN:AUTO[:STATe]?
[:SENSe]:CWLan:IF:GAIN[:STATe] ON | OFF | 1 | 0
[:SENSe]:CWLan:IF:GAIN[:STATe]?
[:SENSe]:CWLan:METHod FAST | BALanced | ACCuracy
[:SENSe]:CWLan:METHod?
[:SENSe]:CWLan:TOSPectrum:BURSt:STARt <integer>
[:SENSe]:CWLan:TOSPectrum:BURSt:STARt?
[:SENSe]:CWLan:TOSPectrum:BURSt:STOP <integer>
[:SENSe]:CWLan:TOSPectrum:BURSt:STOP?
[:SENSe]:CWLan:TOSPectrum[:ENABle] OFF | ON | 0 | 1
[:SENSe]:CWLan:TOSPectrum[:ENABle]?
[:SENSe]:CWLan:TOSPectrum:FOFFset[:STATe] OFF | ON | 0 | 1
[:SENSe]:CWLan:TOSPectrum:FOFFset[:STATe]?
[:SENSe]:CWLan:TRACe:RF[:ENABle] OFF | ON | 0 | 1
[:SENSe]:CWLan:TRACe:RF[:ENABle]?
[:SENSe]:CWLan:TXPower:AVERage[:STATe] OFF | ON | 0 | 1
[:SENSe]:CWLan:TXPower:AVERage[:STATe]?
[:SENSe]:CWLan:TXPower:BURSt:STARt <integer>
[:SENSe]:CWLan:TXPower:BURSt:STARt?
[:SENSe]:CWLan:TXPower:BURSt:STOP <integer>

```
[:SENSe]:CWLan:TXPower:BURSt:STOP?
[:SENSe]:EVM:CHPRate <frequency>
[:SENSe]:EVM:CHPRate?
[:SENSe]:EVM:CLKadj <real>
[:SENSe]:EVM:CLKadj?
[:SENSe]:EVM:EQUalizer:LENGth <integer>
[:SENSe]:EVM:EQUalizer:LENGth?
[:SENSe]:EVM:EQUalizer[:STATe] OFF | ON | 0 | 1
[:SENSe]:EVM:EQUalizer[:STATe]?
[:SENSe]:EVM:PREamble ALL | NONE | PONLy | PHONly
[:SENSe]:EVM:PREamble?
[:SENSe]:FEED AREFerence
[:SENSe]:FEED IQ | IONLy | QONLy
[:SENSe]:FEED RF | AIQ | EMIXer
[:SENSe]:FEED?
[:SENSe]:FEED?
[:SENSe]:FEED:AREFerence REF50 | REF4800 | OFF
[:SENSe]:FEED:AREFerence?
[:SENSe]:RADio:STANdard W11A | W11B | W11GOFDM | W11GDSSS |
W11N
[:SENSe]:RADio:STANdard?
[:SENSe]:ROSCillator:COUPling NORMal | NACQuisition
[:SENSe]:ROSCillator:COUPling?
[:SENSe]:ROSCillator:EXTernal:FREQuency <freq>
[:SENSe]:ROSCillator:EXTernal:FREQuency?
[:SENSe]:ROSCillator:SOURce INTernal | EXTernal
[:SENSe]:ROSCillator:SOURce?
[:SENSe]:ROSCillator:SOURce:TYPE INTernal | EXTernal | SENSe
[:SENSe]:ROSCillator:SOURce:TYPE?
SYSTem:APPLication:CATalog[:NAME]?
SYSTem:APPLication:CATalog[:NAME]:COUNt?
SYSTem:APPLication:CATalog:OPTion? <model>
SYSTem:APPLication:CATalog:REVision? <model>
SYSTem:APPLication[:CURRent][:NAME]?
SYSTem:APPLication[:CURRent]:OPTion?
SYSTem:APPLication[:CURRent]:REVision?
SYSTem:COMMunicate:GPIB[1][:SELF]:ADDRess <integer>
SYSTem:COMMunicate:GPIB[1][:SELF]:ADDRess?
SYSTem:COMMunicate:GPIB[1][:SELF]:CONTroller[:ENABle] ON |
OFF | 0 | 1
```

SYSTem:COMMunicate:GPIB[1][:SELF]:CONTroller[:ENABle]?
SYSTem:COMMunicate:LAN:SCPI:SICL:ENABle OFF | ON | 0 | 1
SYSTem:COMMunicate:LAN:SCPI:SICL:ENABle?
SYSTem:COMMunicate:LAN:SCPI:SOCKet:CONTrol?
SYSTem:COMMunicate:LAN:SCPI:SOCKet:ENABle OFF | ON | 0 | 1
SYSTem:COMMunicate:LAN:SCPI:SOCKet:ENABle?
SYSTem:COMMunicate:LAN:SCPI:TELNet:ENABle OFF | ON | 0 | 1
SYSTem:COMMunicate:LAN:SCPI:TELNet:ENABle?
SYSTem:COMMunicate:USB:CONNection?
SYSTem:COMMunicate:USB:PACKets?
SYSTem:COMMunicate:USB:STATus?
SYSTem:CONFigure[:SYSTem]?
SYSTem:DATE "<year>, <month>, <day>"
SYSTem:DATE?
SYSTem:DEFault [ALL] | ALIGn | INPut | MISC | MODes | PON
SYSTem:ERRor[:NEXT]?
SYSTem:ERRor:VERBose OFF | ON | 0 | 1
SYSTem:ERRor:VERBose?
SYSTem:HELP:HEADers?
SYSTem:HID?
SYSTem:IDN <string>
SYSTem:IDN?
SYSTem:KLOCk OFF | ON | 0 | 1
SYSTem:KLOCk?
SYSTem:LKEY <"OptionInfo">, <"LicenseInfo">
SYSTem:LKEY? <"OptionInfo">
SYSTem:LKEY:DELete <"OptionInfo">, <"LicenseInfo">
SYSTem:LKEY:LIST?
SYSTem:MRELay:COUNt?
SYSTem:OPTions?
SYSTem:PDOWn [NORMal | FORCe]
SYSTem:PON:APPLication:LLISt <stringofINSTrument:SELectnames>
SYSTem:PON:APPLication:LLISt?
SYSTem:PON:APPLication:VMEMory[:AVAilable]?
SYSTem:PON:APPLication:VMEMory:TOTal?
SYSTem:PON:APPLication:VMEMory:USED?
SYSTem:PON:APPLication:VMEMory:USED:NAME?
<INSTrument:SELectname>
SYSTem:PON:ETIMe?

SYSTem:PON:MODE SA | BASIC | ADEMOD | NFIGURE | PNOISE | CDMA2K | TDSCDMA | VSA | VSA89601 | WCDMA | WIMAXOFDMA
SYSTem:PON:MODE?
SYSTem:PON:TIME?
SYSTem:PON:TYPE PRESet
SYSTem:PON:TYPE MODE | USER | LAST
SYSTem:PON:TYPE?
SYSTem:PRESet
SYSTem:PRESet:TYPE FACTory | MODE | USER
SYSTem:PRESet:TYPE?
SYSTem:PRESet:USER
SYSTem:PRESet:USER:ALL
SYSTem:PRESet:USER:SAVE
SYSTem:PRINt:THEMe TDColor | TDMonochrome | FCOLor | FMONochrome
SYSTem:PRINt:THEMe?
SYSTem:PUP:PROCess
SYSTem:SECurity:USB:WPRotect[:ENABle] ON | OFF | 0 | 1
SYSTem:SECurity:USB:WPRotect[:ENABle]?
SYSTem:SHOW OFF | ERRor | SYSTem | HARDware | LXI | HWSTatistics | ALIGnment | SOFTware | CAPPlication
SYSTem:SHOW?
SYSTem:TEMPerature:HEXTreme?
SYSTem:TEMPerature:LEXTreme?
SYSTem:TIME "<hour>, <minute>, <second>"
SYSTem:TIME?
SYSTem:VERSion?

T

TRIGger|TRIGger1|TRIGger2[:SEQuence]:OUTPut HSWP | MEASuring | MAIN | GATE | GTRigger | OEVen | SPOint | SSWeep | SSETtled | S1Marker | S2Marker | S3Marker | S4Marker | OFF
TRIGger|TRIGger1|TRIGger2[:SEQuence]:OUTPut?
TRIGger|TRIGger1|TRIGger2[:SEQuence]:OUTPut:POLarity POSitive | NEGative
TRIGger|TRIGger1|TRIGger2[:SEQuence]:OUTPut:POLarity?
TRIGger:<measurement>[:SEQuence]:IQ:SOURce EXTernal1 | EXTernal2 | IMMediate | IQMag | IDEMod | QDEMod | IINPut | QINPut | AIQMag

TRIGger:<measurement>[:SEQuence]:IQ:SOURce?
TRIGger:<measurement>[:SEQuence]:RF:SOURce EXTernal1 | EXTernal2 | IMMediate | LINE | FRAMe | RFBurst | VIDeo | IF | ALARm | LAN | TV
TRIGger:<measurement>[:SEQuence]:RF:SOURce?
TRIGger:<measurement>[:SEQuence]:SOURce EXTernal1 | EXTernal2 | IMMediate | LINE | FRAMe | RFBurst | VIDeo | IF | ALARm | LAN | IQMag | IDEMod | QDEMod | IINPut | QINPut | AIQMag | TV
TRIGger:<measurement>[:SEQuence]:SOURce?
TRIGger[:SEQuence]:ATRigger <time>
TRIGger[:SEQuence]:ATRigger?
TRIGger[:SEQuence]:ATRigger:STATe OFF | ON | 0 | 1
TRIGger[:SEQuence]:ATRigger:STATe?
TRIGger[:SEQuence]:DELay
TRIGger[:SEQuence]:DELay <time>
TRIGger[:SEQuence]:DELay?
TRIGger[:SEQuence]:DELay:STATe OFF | ON | 0 | 1
TRIGger[:SEQuence]:DELay:STATe?
TRIGger[:SEQuence]:EXTernal1:DELay <time>
TRIGger[:SEQuence]:EXTernal1:DELay?
TRIGger[:SEQuence]:EXTernal1:DELay:STATe OFF | ON | 0 | 1
TRIGger[:SEQuence]:EXTernal1:DELay:STATe?
TRIGger[:SEQuence]:EXTernal1:LEVel <level>
TRIGger[:SEQuence]:EXTernal1:LEVel?
TRIGger[:SEQuence]:EXTernal1:SLOPe POSitive | NEGative
TRIGger[:SEQuence]:EXTernal1:SLOPe?
TRIGger[:SEQuence]:EXTernal2:DELay <time>
TRIGger[:SEQuence]:EXTernal2:DELay?
TRIGger[:SEQuence]:EXTernal2:DELay:STATe OFF | ON | 0 | 1
TRIGger[:SEQuence]:EXTernal2:DELay:STATe?
TRIGger[:SEQuence]:EXTernal2:LEVel
TRIGger[:SEQuence]:EXTernal2:LEVel?
TRIGger[:SEQuence]:EXTernal2:SLOPe POSitive | NEGative
TRIGger[:SEQuence]:EXTernal2:SLOPe?
TRIGger[:SEQuence]:EXTernal:DELay
TRIGger[:SEQuence]:EXTernal:LEVel
TRIGger[:SEQuence]:EXTernal:SLOPe
TRIGger[:SEQuence]:FRAMe:DELay <time>
TRIGger[:SEQuence]:FRAMe:DELay?

```
TRIGger[:SEQuence]:FRAMe:DELay:STATe OFF | ON | 0 | 1
TRIGger[:SEQuence]:FRAMe:DELay:STATe?
TRIGger[:SEQuence]:FRAMe:EXTernal1:LEVel
TRIGger[:SEQuence]:FRAMe:EXTernal1:SLOPe
TRIGger[:SEQuence]:FRAMe:EXTernal2:LEVel
TRIGger[:SEQuence]:FRAMe:EXTernal2:SLOPe
TRIGger[:SEQuence]:FRAMe:OFFSet <time>
TRIGger[:SEQuence]:FRAMe:OFFSet?
TRIGger[:SEQuence]:FRAMe:OFFSet:DISPlay:RESet
TRIGger[:SEQuence]:FRAMe:PERiod <time>
TRIGger[:SEQuence]:FRAMe:PERiod?
TRIGger[:SEQuence]:FRAMe:RFBurst:LEVel:ABSolute
TRIGger[:SEQuence]:FRAMe:RFBurst:SLOPe
TRIGger[:SEQuence]:FRAMe:SYNC EXTernal
TRIGger[:SEQuence]:FRAMe:SYNC EXTernal1 | EXTernal2 | RFBurst
| OFF
TRIGger[:SEQuence]:FRAMe:SYNC?
TRIGger[:SEQuence]:HOLDoff <time>
TRIGger[:SEQuence]:HOLDoff?
TRIGger[:SEQuence]:HOLDoff:STATe OFF | ON | 0 | 1
TRIGger[:SEQuence]:HOLDoff:STATe?
TRIGger[:SEQuence]:HOLDoff:TYPE NORMal | ABOVe | BELow
TRIGger[:SEQuence]:HOLDoff:TYPE?
TRIGger[:SEQuence]:IF:DELay
TRIGger[:SEQuence]:IF:LEVel
TRIGger[:SEQuence]:IF:LEVel?
TRIGger[:SEQuence]:IF:SLOPe NEGative | POSitive
TRIGger[:SEQuence]:IF:SLOPe?
TRIGger[:SEQuence]:LINE:DELay <time>
TRIGger[:SEQuence]:LINE:DELay?
TRIGger[:SEQuence]:LINE:DELay:STATe OFF | ON | 0 | 1
TRIGger[:SEQuence]:LINE:DELay:STATe?
TRIGger[:SEQuence]:LINE:SLOPe POSitive | NEGative
TRIGger[:SEQuence]:LINE:SLOPe?
TRIGger[:SEQuence]:OFFSet <time>
TRIGger[:SEQuence]:OFFSet?
TRIGger[:SEQuence]:OFFSet:STATe OFF | ON | 0 | 1
TRIGger[:SEQuence]:OFFSet:STATe?
TRIGger[:SEQuence]:RFBurst:DELay <time>
TRIGger[:SEQuence]:RFBurst:DELay?
```

TRIGger[:SEQuence]:RFBurst:DELay:STATe OFF | ON | 0 | 1
TRIGger[:SEQuence]:RFBurst:DELay:STATe?
TRIGger[:SEQuence]:RFBurst:LEVel
TRIGger[:SEQuence]:RFBurst:LEVel:ABSolute <ampl>
TRIGger[:SEQuence]:RFBurst:LEVel:ABSolute?
TRIGger[:SEQuence]:RFBurst:LEVel:RELative <rel_ampl>
TRIGger[:SEQuence]:RFBurst:LEVel:RELative?
TRIGger[:SEQuence]:RFBurst:LEVel:TYPE ABSolute | RELative
TRIGger[:SEQuence]:RFBurst:LEVel:TYPE?
TRIGger[:SEQuence]:RFBurst:SLOPe POSitive | NEGative
TRIGger[:SEQuence]:RFBurst:SLOPe?
TRIGger[:SEQuence]:SLOPe POSitive | NEGative
TRIGger[:SEQuence]:SLOPe?
TRIGger[:SEQuence]:SOURCe EXTernal
TRIGger[:SEQuence]:VIDeo:DELay <time>
TRIGger[:SEQuence]:VIDeo:DELay?
TRIGger[:SEQuence]:VIDeo:DELay:STATe OFF | ON | 0 | 1
TRIGger[:SEQuence]:VIDeo:DELay:STATe?
TRIGger[:SEQuence]:VIDeo:LEVel <ampl>
TRIGger[:SEQuence]:VIDeo:LEVel?
TRIGger[:SEQuence]:VIDeo:SLOPe POSitive | NEGative
TRIGger[:SEQuence]:VIDeo:SLOPe?

Combined WLAN

Auto Couple

The Auto Couple feature provides a quick and convenient way to automatically couple multiple instrument settings. This helps ensure accurate measurements and optimum dynamic range. When the Auto Couple feature is activated, either from the front panel or remotely, all parameters of the current measurement which have an Auto/Manual mode are set to Auto mode and all measurement settings dependent on (or coupled to) the Auto/Man parameters are automatically adjusted for optimal performance.

However, the Auto Couple keyactions are confined to the current measurement only. It does not affect other measurements in the mode, and it does not affect markers, marker functions, or trace or display attributes.

See "More Information" on page 4-31

Key Path	Front-panel key
Remote Command	`:COUPle ALL|NONE`
Example	:COUP ALL
Notes	:COUPle ALL puts all Auto/Man parameters in Auto mode (equivalent to pressing the Auto Couple key). :COUPLE NONE puts all Auto/Man parameters in manual mode. It decouples all the coupled instrument parameters and is not recommended for making measurements.
Initial S/W Revision	Prior to A.02.00

More Information

There are two types of functions that have Auto/Manual modes.

Auto/Man Active Function keys

An Auto/Man toggle key controls the binary state associated with an instrument parameter by toggling between "Auto" (where the parameter is automatically coupled to the other parameters it is dependent upon) and "Man" (where the parameter is controlled independent of the other parameters), as well as making the parameter the active function. The current mode is indicated on the softkey with either "Auto" or "Man" underlined as illustrated below.

Auto/Man 1-of-N keys

An Auto/Man 1-of-N key allows you to manually pick from a list of parameter values, or place the function in "Auto" in which case the value is automatically selected (and indicated) as shown below. If in Auto, Auto is underlined on the calling key. If in manual operation, manual is indicated on the calling key. But the calling key does not actually toggle the function, it simply opens the menu.

BW

The mode does not have BW functionality.

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

Cont (Continuous Measurement/Sweep)

Sets the analyzer for Continuous measurement operation. The single/continuous state is Meas Global so the setting will affect all measurements. If you are Paused, pressing Cont does a Resume.

Key Path	Front panel key
Remote Command	`:INITiate:CONTinuous OFF|ON|0|1`
	`:INITiate:CONTinuous?`
Example	:INIT:CONT 0 puts analyzer in Single measurement operation.
	:INIT:CONT 1 puts analyzer in Continuous measurement operation
Preset	ON
	(Note that SYST:PRESet sets INIT:CONT to ON but *RST sets INIT:CONT to OFF)
State Saved	Saved in instrument state
Backwards Compatibility Notes	For Spectrum Analysis mode in ESA and PSA, there is no Cont hardkey, instead there is a Sweep Single/Cont softkey. In these analyzers, switching the Sweep Single/Cont softkey from Single to Cont restarts averages (displayed average count reset to 1), but does not restart Max Hold and Min Hold.
	The X-Series has Single and Cont hardkeys in place of the Sweep Single Cont softkey. In the the X-Series, if in single measurement, the Cont hardkey (and INIT:CONT ON) switches to continuous measurement, but never restarts a measurement and never resets a sweep.
Initial S/W Revision	Prior to A.02.00

In Swept SA Measurement (Spectrum Analysis Mode):

The analyzer takes repetitive sweeps, averages, measurements, etc., when in Continuous mode. When the average count reaches the Average/Hold Number the count stops incrementing, but the analyzer keeps sweeping. See the Trace/Detector section for the averaging formula used both before and after the Average/Hold Number is reached. The trigger condition must be met prior to each sweep. The type of trace processing for multiple sweeps, is set under the Trace/Detector key, with choices of Trace Average, Max Hold, or Min Hold.

In Other Measurements/Modes:

With Avg/Hiold Num (in the Meas Setup menu) set to Off or set to On with a value of 1, a sweep is taken after the trigger condition is met; and the analyzer

continues to take new sweeps after the current sweep has completed and the trigger condition is again met. However, with Avg/Hold Num set to On with a value >1, multiple sweeps (data acquisitions) are taken for the measurement. The trigger condition must be met prior to each sweep. The sweep is not stopped when the average count k equals the number N set for Avg/Hold Num is reached, but the number k stops incrementing. A measurement average usually applies to all traces, marker results, and numeric results. But sometimes it only applies to the numeric results.

If the analyzer is in Single measurement, pressing the Cont key does not change k and does not cause the sweep to be reset; the only action is to put the analyzer into Continuous measurement operation.

If it is already in continuous sweep:

the INIT:CONT 1 command has no effect

the INIT:CONT 0 command will place the analyzer in Single Sweep but will have no effect on the current sequence until k = N, at which point the current sequence will stop and the instrument will go to the idle state.

File

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

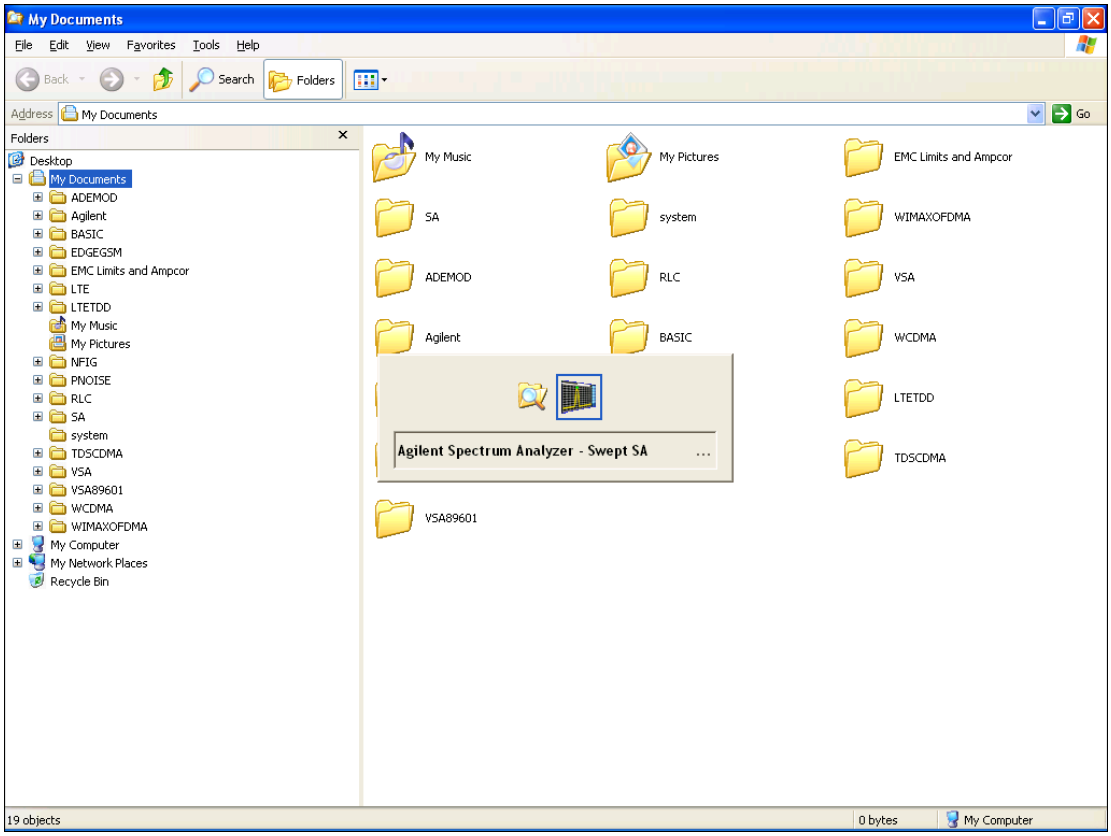
Key Path	Front-panel key
Initial S/W Revision	Prior to A.02.00

File Explorer

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

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

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



Or use Alt-Tab: press and hold the Alt 

key and press and release the Tab key until the Analyzer logo is showing in the window in the center of the screen, as above, then release the Alt key.

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

Print

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

Maximize/Restore Down

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

Maximize

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

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

Restore Down

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

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

Preset Type (Remote Command Only)

As stated in the Backward Compatibility section above, to be compatible with ESA/PSA the PRESet:TYPE command will be implemented as a no-op.

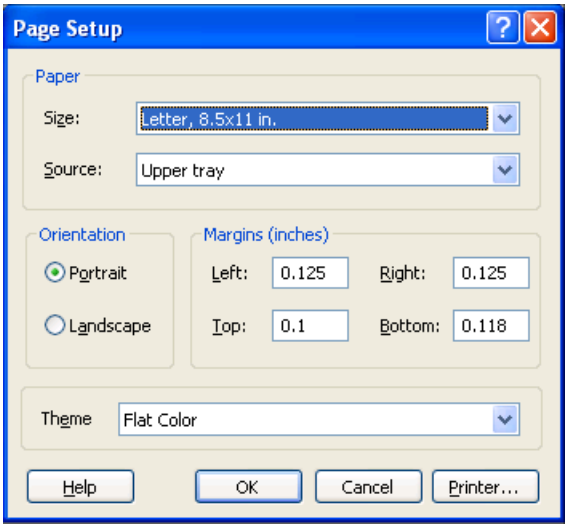
Mode	All
Remote Command	`:SYSTem:PRESet:TYPE FACTory|MODE|USER` `:SYSTem:PRESet:TYPE?`
Example	:SYST:PRES:TYPE FACT
Notes	This command is supported for backward compatibility only. It is a no-op which does not change the behavior of any preset operation.
Preset	MODE
Preset	This is unaffected by Preset but is set to Mode on a "Restore System Defaults->All"
State Saved	No
Initial S/W Revision	Prior to A.02.00

Page Setup

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

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

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



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

Parameter Name	Print Themes
Parameter Type	Enum
Mode	All
Remote Command	`:SYSTem:PRINt:THEMe TDColor|TDMonochrome|FCOLor|FMONochrome` `:SYSTem:PRINt:THEMe?`
Example	:SYST:PRIN:THEM FCOL
Setup	:SYSTem:DEFault MISC
Preset	FCOL; not part of Preset, but is reset by Restore Misc Defaults or Restore System Defaults All and survives subsequent running of the modes.
State Saved	No
Initial S/W Revision	Prior to A.02.00

Print

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

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

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

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

Maximize

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

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

Minimize

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

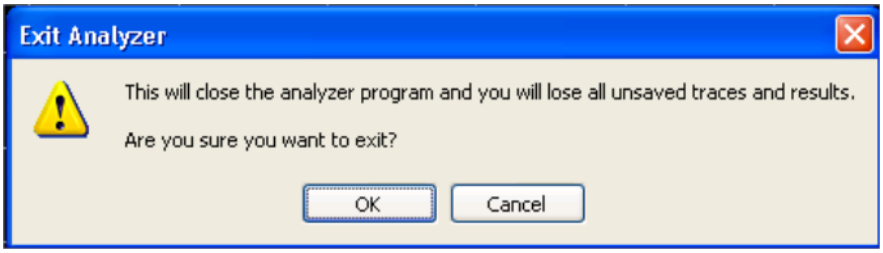
hold the Alt 

key and press and release the Tab key) to restore the analyzer display.

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

Exit

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



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

FREQ Channel

The mode does not have FREQ Channel functionality.

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

Input/Output

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

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

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

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

"Input/Output variables - Preset behavior" on page 4-46

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

Remote Command	`[:SENSe]:FEED RF|AIQ|EMIXer`
	`[:SENSe]:FEED?`
Example	:FEED RF
	:FEED?
Couplings	The [:SENSe]:FEED RF command turns the calibrator OFF
Preset	This setting is unaffected by a Preset or power cycle. It survives a Mode Preset and mode changes.
	It is set to RF on a "Restore Input/Output Defaults" or "Restore System Defaults->All"
State Saved	Saved in instrument state
Backwards Compatibility SCPI	`[:SENSe]:FEED AREFerence`
	In the PSA the calibrator was one of the inputs and selected using the AREF

parameter to the same :FEED command that switched the inputs. In the X-Series it is controlled in a separate menu and overrides the input selection. For code compatibility the [:SENSe]:FEED AREFerence command is provided, and is aliased to [SENSe]:FEED:AREF REF50, which causes the input to be switched to the 50 MHz calibrator. The [:SENSe]:FEED RF command switches the input back to the RF port and turns the calibrator OFF, thus providing full compatibility with the PSA calibrator function.

```
Note that after sending this, the query [:SENSe]:FEED? will
NOT return "AREF" but instead the currently selected input.
```

Backwards Compatibility SCPI

```
[:SENSe]:FEED IQ|IONLy|QONLy
[:SENSe]:FEED?
```

The parameters IQ | IONLy | QONLy are supported for backwards compatibility with the E44406A.

[:SENSe]:FEED IQ aliases to [:SENSe]:FEED:IQ:TYPE IQ

[:SENSe]:FEED IONLy aliases to [:SENSe]:FEED:IQ:TYPE IONLy

[:SENSe]:FEED QONLy aliases to [:SENSe]:FEED:IQ:TYPE QONLy

The query [:SENSe]:FEED? will always returns AIQ whatever the type of legacy parameters IQ | IONLy | QONLy has been used.

Backwards Compatibility Notes

Most of the settings in the X-Series Input/Output system, including External Gain, Amplitude Corrections settings and data, etc, are shared by all modes and are not changed by a mode switch. Furthermore, most variables in the Input/Output system key are not affected by Mode Preset. Both of these behaviors represent a departure from legacy behavior.

In the X-Series. Input/Output settings are reset by using the "Restore Input/Output Defaults" function. They can also be reset to their default values through the System->Restore System Defaults-> In/Out Config key or through the System ->Restore System Defaults -> All key (and corresponding SCPI).

While this matches most use cases better, it does create some code compatibility issues. For example, Amplitude Corrections are no longer turned off by a Mode Preset, but instead by using the "Restore Input/Output Defaults" key/SCPI.

Although Input/Output settings are not part of each Mode's State, they are saved in the Save State files, so that all of the instrument settings can be recalled with Recall State, as in legacy instruments.

Initial S/W Revision

Prior to A.02.00

Remote Command	`:INPut:MIXer EXTernal|INTernal`
	`:INPut:MIXer?`
Example	INP:MIX INT
	INP:MIX?
Notes	For compatibility, the INPut:MIXer EXTernal|INTernal legacy command is mapped as follows:
	1. When INPut:MIXer EXTernal is received, SENSe:FEED EMIXer is executed.
	2. When INPut:MIXer INTernal is received, SENSe:FEED RF is executed.
	3. When INPut:MIXer? is received, the response will be INT if any input other than the external mixer is selected and EXT if the external mixer is selected
Preset	INT
Backwards Compatibility Notes	:INPut:MIXer:TYPE PRESelected|UNPReselect
	:INPut:MIXer:TYPE?
	PXA does not support the :INPut:MIXer:TYPE command.
Initial S/W Revision	A.08.01

Input/Output variables - Preset behavior

Virtually all the input/output settings are NOT a part of mode preset. They can be set to their default value by one of the three ways - by using the Restore Input/Output Defaults key on the first page of the input/output menu, by using the System->Restore System Defaults->Input/Output Settings or by using the System -> Restore System Defaults->All. Also, they survive a Preset and a Power cycle.

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

RF Input

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

Key Path	Input/Output
Example	[:SENSe]:FEED RF
Readback	The RF input port, RF coupling, and current input impedance settings appear on this key as: "XX, YY, ZZ" where XX is RF, RF2, RFIO1, RFIO2, depending on what input is selected (only appears on analyzers with multiple RF inputs) YY is AC or DC ZZ is 50Ω or 75Ω
Initial S/W Revision	Prior to A.02.00

Input Z Correction

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

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

Key Path	Input/Output, RF Input
Remote Command	`[:SENSe]:CORRection:IMPedance[:INPut][:MAGNitude] 50|75`
	`[:SENSe]:CORRection:IMPedance[:INPut][:MAGNitude]?`
Example	CORR:IMP 75 sets the input impedance correction to 75 ohms.
	CORR:IMP?

Preset	This is unaffected by a Preset but is set to 50 ohms on a "Restore Input/Output Defaults" or "Restore System Defaults->All" Some instruments/options may have 75 ohms available.
State Saved	Saved in instrument state
Readback	50 Ω or 75 Ω. Current setting reads back to the RF key.
Initial S/W Revision	Prior to A.02.00

RF Coupling

Specifies alternating current (AC) or direct current (DC) coupling at the analyzer RF input port. Selecting AC coupling switches in a blocking capacitor that blocks any DC voltage present at the analyzer input. This decreases the input frequency range of the analyzer, but prevents damage to the input circuitry of the analyzer if there is a DC voltage present at the RF input.

In AC coupling mode, you can view signals below the corner frequency of the DC block, but below a certain frequency the amplitude accuracy is not specified. The frequency below which specifications do not apply is:

X-Series Model	Lowest Freq for meeting specs when AC coupled	Lowest Freq for meeting specs when DC coupled
N9000A	100 kHz	n/a
N9010A	10 MHz	9 kHz
N9020A	10 MHz	3 Hz
N9030A	10 MHz	3 Hz

Some amplitude specifications apply only when coupling is set to DC. Refer to the appropriate amplitude specifications and characteristics for your analyzer.

When operating in DC coupled mode, ensure protection of the analyzer input circuitry by limiting the DC part of the input level to within 200 mV of 0 Vdc. In AC or DC coupling, limit the input RF power to +30 dBm (1 Watt).

Key Path	Input/Output, RF Input

Remote Command	`:INPut:COUPling AC|DC` `:INPut:COUPling?`
Example	INP:COUP DC
Dependencies	This key does not appear in models that are always AC coupled. When the SCPI command to set DC coupling is sent to these models, it results in the error “Illegal parameter value;This model is always AC coupled” In these models, the SCPI query INP:COUP? always returns AC. This key does not appear in models that are always DC coupled.When the SCPI command to set AC coupling is sent to these models, it results in the error “Illegal parameter value;This instrument is always DC coupled” In these models, the SCPI query INP:COUP? always returns DC.
Preset	AC on models that support AC coupling On models that are always DC coupled, such as millimeter wave models (frequency ranges 30 GHz and above), the preset is DC.
State Saved	Saved in instrument state.
Initial S/W Revision	Prior to A.02.00
Modified at S/W Revision	A.03.00

RF Calibrator

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

Key Path	Input/Output
Remote Command	`[:SENSe]:FEED:AREFerence REF50|REF4800|OFF` `[:SENSe]:FEED:AREFerence?`
Example	FEED:AREF REF50 selects the 50 MHz amplitude reference as the signal input. FEED:AREF REF4800 selects the 4.8 GHz amplitude reference as the signal input FEED:AREF OFF turns the calibrator "off" (switches back to the selected input – RF or I/Q)
Dependencies	Selecting an input (RF or I/Q) turns the Calibrator OFF. This is true whether the input is selected by the keys or with the [:SENSe]:FEED command. The 4.8 GHz internal reference is only available in some models and frequency range options. If the 4.8 GHz reference is not present, the 4.8 GHz softkey will be blanked, and if the REF4800 parameter is sent, the analyzer will generate an error.
Couplings	When one of the calibrator signals is selected, the analyzer routes that signal (an internal

	amplitude reference) to the analyzer, and changes the main input selection to RF so the calibrator signal can be seen. When you turn the calibrator off it does not switch back to the previously selected input.
Preset	OFF
State Saved	Saved in instrument state
Readback	Off, 50 MHz, 4.8 GHz
Initial S/W Revision	Prior to A.02.00

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

50 MHz

Selects the 50 MHz internal reference as the input signal.

Key Path	Input/Output, RF Calibrator
Example	:FEED:AREF REF50
Readback	50 MHz
Initial S/W Revision	Prior to A.02.00

4.8 GHz

Selects the 4.8 GHz internal reference as the input signal.

Key Path	Input/Output, RF Calibrator
Example	:FEED:AREF REF4800
Dependencies	The 4.8 GHz internal reference is only available in some models and frequency range options. If the 4.8 GHz reference is not present, the 4.8 GHz softkey will be blanked, and if the REF4800 parameter is sent, the analyzer will generate an error.
Readback	4.8 GHz
Initial S/W Revision	Prior to A.02.00
Modified at S/W Revision	A.03.00

Off

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

Key Path	Input/Output, RF Calibrator
Example	:FEED:AREF OFF
Readback	Off
Initial S/W Revision	Prior to A.02.00

External Gain

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

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

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

In the Spectrum Analyzer mode, a Preamp is the common external device providing gain or loss. In a measurement application mode like GSM or W-CDMA, the gain or loss could be from a BTS (Base Transceiver Station) or an MS (Mobile Station). So in the Spectrum Analyzer mode MS and BTS would be grayed out and the only choice would be Ext Preamp. Similarly in some of the digital communications applications, Ext Preamp will be grayed out and you would have a choice of MS or BTS.

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

Ext Preamp

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

Note that the Ref Lvl Offset and Maximum Mixer Level are described in the Amplitude section. They are reset by the instrument Preset. The External Preamp Gain is reset by the "Restore Input/Output Defaults" or "Restore System Defaults-

>All functions. . The External Gain is subtracted from the amplitude readout so that the displayed signal level represents the signal level at the output of the device-under-test, which is the input of the external device that is providing gain or loss.

Key Path	Input/Output, External Gain
Remote Command	`[:SENSe]:CORRection:SA[:RF]:GAIN <rel_ampl>`
	`[:SENSe]:CORRection:SA[:RF]:GAIN?`
Example	CORR:SA:GAIN 10 sets the Ext Gain value to 10 dB
	CORR:SA:GAIN –10 sets the Ext Gain value to –10 dB (that is, an attenuation of 10 dB)
Notes	Does not auto return.
Dependencies	The reference level limits are determined in part by the External Gain/Atten, Max Mixer Level, and RF Atten.
	This key is grayed out in Modes that do not support External Gain
Preset	This is unaffected by Preset but is set to 0 dB on a "Restore Input/Output Defaults" or "Restore System Defaults->All"
State Saved	Saved in instrument state
Min	–81.90 dB
Max	81.90 dB
Readback	Preamp Gain, <Ext Gain value> dB
Backwards Compatibility SCPI	`[:SENSe]:CORRection:OFFSet[:MAGNitude]`
	The legacy "Ext Preamp Gain" key is now called "Ext Gain" and the sub-menu has choices of Ext Preamp | MS | BTS for backwards compatibility.
Initial S/W Revision	Prior to A.02.00

MS

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

Key Path	Input/Output, External Gain
Remote Command	`[:SENSe]:CORRection:MS[:RF]:GAIN <rel_ampl>`
	`[:SENSe]:CORRection:MS[:RF]:GAIN?`
Example	CORR:MS:GAIN 10 sets the Ext Gain value to 10 dB
	CORR:MS:GAIN –10 sets the Ext Gain value to –10 dB (that is, a loss of 10 dB.)

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

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

BTS

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

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

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

Restore Input/Output Defaults

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

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

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

Freq Ref In

Specifies the frequency reference as being the internal reference, external reference or sensing the presence of an external reference.

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

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

If Sense is selected, the instrument checks whether a signal is present at the external reference connector and will automatically switch to the external reference when a signal is detected. When no signal is present, it automatically switches to the internal reference. No message is generated as the reference switches between external and internal. The monitoring of the external reference occurs approximately on 1 millisecond intervals, and never occurs in the middle

of a measurement acquisition, only at the end of the measurement (end of the request).

If for any reason the instrument's frequency reference is not able to obtain lock, Status bit 2 in the Questionable Frequency register will be true and a condition error message is generated. When lock is regained, Status bit 2 in the Questionable Frequency register will be cleared and the condition error will be cleared.

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

Key Path	Input/Output
Remote Command	`[:SENSe]:ROSCillator:SOURce:TYPE INTernal|EXTernal|SENSe` `[:SENSe]:ROSCillator:SOURce:TYPE?`
Preset	This is unaffected by a Preset but is set to SENSe on a "Restore Input/Output Defaults" or "Restore System Defaults->All".
State Saved	Saved in instrument state.
Status Bits/OPC dependencies	STATus:QUEStionable:FREQuency bit 2 set if unlocked.
Backwards Compatibility Notes	
Initial S/W Revision	Prior to A.02.00

Remote Command	`[:SENSe]:ROSCillator:SOURce?`
Notes	The query [SENSe]:ROSCillator:SOURce? returns the current switch setting. This means:
Preset	SENSe
Backwards Compatibility Notes	The query [:SENSe]:ROSCillator:SOURce? was a query-only command in ESA which always returned whichever reference the instrument was using. The instrument automatically switched to the ext ref if it was present. In PSA (which had no sensing) the command [:SENSe]:ROSCillator:SOURce set the reference (INT or EXT), so again its query returned the actual routing. Thus the query form of this command is 100% backwards compatible with both instruments.

Initial S/W Revision	Prior to A.02.00

Remote Command	`[:SENSe]:ROSCillator:SOURce INTernal|EXTernal`
Notes	For PSA compatibility the command form is provided and is directly mapped to [:SENSe]:ROSCillator:SOURce:TYPE
Initial S/W Revision	Prior to A.02.00

Sense

The external reference is used if a valid signal is sensed at the Ext Ref input. Otherwise the internal reference is used.

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

Internal

The internal reference is used.

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

External

The external reference is used.

Key Path	Input/Output, Freq Ref In

Example	:ROSC:SOUR:TYPE EXT
Readback	External
Initial S/W Revision	Prior to A.02.00

Ext Ref Freq

This key tells the analyzer the frequency of the external reference. When the external reference is in use (either because the reference has been switched to External or because the Reference has been switched to Sense and there is a valid external reference present) this information is used by the analyzer to determine the internal settings needed to lock to that particular external reference signal.

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

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

Key Path	Input/Output, Freq Ref In
Remote Command	`[:SENSe]:ROSCillator:EXTernal:FREQuency <freq>`
	`[:SENSe]:ROSCillator:EXTernal:FREQuency?`
Example	ROSC:EXT:FREQ 20 MHz sets the external reference frequency to 20 MHz, but does not select the external reference.
	ROSC:SOUR:TYPE EXT selects the external reference.
Notes	Still available with Internal selected, to allow setup for when External is in use.
Preset	This is unaffected by a Preset but is set to 10 MHz on a "Restore Input/Output Defaults" or "Restore System Defaults->All"
Min	CXA: 10 MHz
	EXA: 10 MHz or 13 MHz, depending on whether N9010A-R13 is licensed
	MXA: 1 MHz
	PXA: 1 MHz
Max	CXA: 10 MHz

EXA: 10 MHz
MXA: 50 MHz
PXA: 50 MHz

Default Unit	Hz
Initial S/W Revision	Prior to A.02.00

External Ref Coupling

Only appears with option ERC installed and licensed.

This function lets you couple the sweep system of the analyzer to the state of the External Reference. If Normal is selected, data acquisition proceeds regardless of the state of the External Reference. When you select Ext Ref Out Of Range Stops Acquisition, the data acquisition (sweep or measurement) stops when either the "521, External ref out of range" or the "503, Frequency Reference unlocked" error message is asserted. Note that this will only take place if the Freq Ref In selection is External.

With the acquisition stopped, the data display will stop updating (even if this occurs in the middle of a sweep or measurement) and no data will be returned to a READ? or MEASure? query; that is, these queries will not complete because the analyzer will not respond to them. Furthermore, no response will be generated to a *WAI? or *OPC? query.

Proper SCPI sequences are shown below, which will always fail to return if the acquisition stops during the requested sweep or measurement. Note that, for predictable operation of this function, it is best to operate the analyzer in single measurement mode (INIT:CONT OFF), because if operating in continuous mode, the analyzer may respond to the above queries even after the acquisition stops, with data left over from the previous acquisition.

:INIT:CONT OFF

:INIT:IMM;*OPC?

--

:INIT:CONT OFF

:INIT:IMM;*WAI?

--

:INIT:CONT OFF

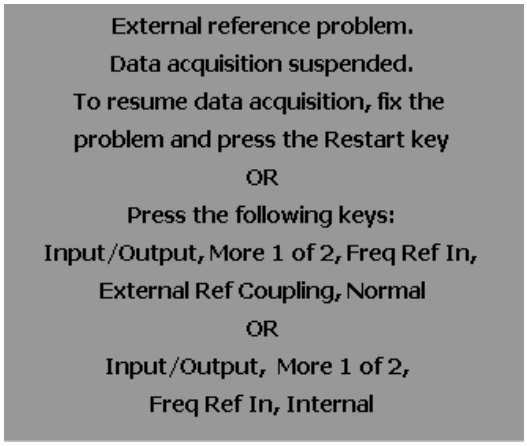
:READ?

--

:INIT:CONT OFF

:MEASure?

When the acquisition ceases, in addition to the error condition(s) described above, a popup error message will be generated informing you that the acquisition has ceased due to an invalid external reference. This message will stay on the screen while the acquisition is suspended.



If you press the Restart key this message will be taken off the screen and a new acquisition will be attempted; if the External Reference problem persists the message will go right back up. You can also take the message down by changing back to the Normal setting of Sweep/Ext Ref Coupling, or by pressing Freq Ref In, Internal, or Freq Ref In, Sense, or Restore Input/Output Defaults.

The setting of External Ref Coupling is persistent across power-cycling and is not reset with a Preset. It is reset to the default state (Normal) when Restore Input/Output Defaults is invoked, which will also restart normal data acquisition.

The detection of invalid external reference is under interrupt processing. If the external reference becomes invalid then returns to valid in too short a time, no error condition will be detected or reported and therefore the acquisition will not be stopped.

Key Path	Input/Output, Freq Ref In
Mode	All
Remote Command	`[:SENSe]:ROSCillator:COUPling NORMal|NACQuisition` `[:SENSe]:ROSCillator:COUPling?`
Preset	This setting is persistent: it survives power-cycling or a Preset and is reset with Restore Input/Output defaults.
State Saved	Not saved in instrument state
Readback	Normal|Stop Acq
Initial S/W Revision	A.02.00

Output Config

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

Key Path	Input/Output
Backwards Compatibility Notes	
Initial S/W Revision	Prior to A.02.00

Trig Out (1 and 2)

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

Key Path	Input/Output, Output Config
Remote Command	`:TRIGger|TRIGger1|TRIGger2[:SEQuence]:OUTPut HSWP | MEASuring | MAIN | GATE | GTRigger | OEVen | SPOint | SSWeep | SSETtled | S1Marker | S2Marker | S3Marker | S4Marker | OFF` `:TRIGger|TRIGger1|TRIGger2[:SEQuence]:OUTPut?`

Example	TRIG:OUTP HSWP TRIG2:OUTP GATE
Dependencies	The second Trigger output (Trig 2 Out) does not appear in all models; in models that do not support it, the Trig 2 Out key is blanked, and sending the SCPI command for this output generates an error, “Hardware missing; Not available for this model number” In models that do not support the Trigger 2 output, this error is returned if trying to set Trig 2 Out and a query of Trig 2 Out returns OFF.
Preset	Trigger 1: Sweeping (HSWP) Trigger 2: Gate This is unaffected by a Preset but is preset to the above values on a "Restore Input/Output Defaults" or "Restore System Defaults->All"
State Saved	Saved in instrument state
Initial S/W Revision	Prior to A.02.00

Polarity

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

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

Off

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

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

Sweeping (HSWP)

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

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

Measuring

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

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

Set (Replace) Data (Remote Command Only)

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

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

An Ampcor array can contain 2000 points maximum.

Remote Command	`[:SENSe]:CORRection:CSET[1]...6:DATA <freq>, <ampl>, . . .`
	`[:SENSe]:CORRection:CSET[1]...6:DATA?`
Example	CORR:CSET1:DATA 10000000,–1.0,20000000,1.0
	This defines two correction points at (10 MHz, –1.0 dB) and (20 MHz, 1.0 dB) for correction set 1.
Preset	Empty after Restore Input/Output Defaults. Survives a shutdown or restart of analyzer application (including a power cycle).
State Saved	Saved in instrument state.
Min	Freq: 0 Hz
	Amptd: –1000 dBm
Max	Freq: 1 THz
	Amptd: +1000 dBm
Initial S/W Revision	A.02.00

Gate Trigger

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

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

Gate

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

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

Odd/Even Trace Point

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

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

Analog Out

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

See "More Information" on page 4-67

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

More Information

The table below gives the range for each output.

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

Auto

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

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

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

Off

Turns off the analog output.

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

Screen Video

Selects the analog output to be the screen video signal. In this mode, the pre-detector data is output to the Analog Out connector. The output looks very much like the trace displayed on the analyzer's screen, and depends on the Log/Lin display Scale, Reference Level, and dB per division, but is not influenced by the selected detector or any digital flatness corrections or trace post-processing (like Trace Averaging).

Note that this mode is similar to the Analog Output of the HP 8566 family and the Video Out (opt 124) capability of the Agilent PSA analyzer (E444x), although there are differences in the behavior.

Key Path	Input/Output, Output Config, Analog Out
Example	OUTP:ANAL SVID
Dependencies	Because the Screen Video output uses one of the two IF processing channels, only one detector is available while Screen Video is selected. All active traces will change to use the same detector as the selected trace when Screen Video is activated. Screen Video output is not available while any EMI Detector is selected (Quasi Peak, RMS Average or EMI Average), because these detectors use both IF processing channels. Consequently, if the user chooses an EMI Detector, there will be no Screen Video output. The output holds at its last value during an alignment and during a marker count. After a sweep: • If a new sweep is to follow (as in Continuous sweep mode), the output holds at its last value during the retrace before the next sweep starts. If the analyzer is in zero-span, there is no retrace, as the analyzer remains tuned to the Center Frequency and does not sweep. Therefore, in zero-span, the output simply remains live between display updates. • If no new sweep is to follow (as in Single sweep mode), the output remains live, and continues to show the pre-detector data This function depends on optional capability; the key will be blanked and the command will generate an "Option not available" error unless you have Option YAV or YAS licensed in your instrument.

Couplings	Screen Video output changes while in FFT Sweeps, so for measurements that use exclusively FFT Sweeps, or if the user manually chooses FFT Sweeps, the Screen Video output will look different than it does in swept mode.
Readback Text	Screen Video
Backwards Compatibility Notes	See "Backwards Compatibility:" on page 4-69, below.
Initial S/W Revision	A.04.00

Backwards Compatibility:

The Screen Video function is intended to be very similar to the 8566 Video Output and the PSA Option 124. However, unlike the PSA, it is not always on; it must be switched on by the Screen Video key. Also, unlike the PSA, there are certain dependencies (detailed above) – for example, the Quasi Peak Detector is unavailable when Screen Video is on.

Furthermore, the PSA Option 124 hardware was unipolar and its large range was padded to be exactly right for use as a Screen Video output. In the X-Series, the hardware is bipolar and has a wider range to accommodate the other output choices. Therefore, the outputs won't match up exactly and users may have to modify their setup when applying the X-Series in a PSA application.

Demod Audio

Selects the analog output to be the demodulation of the video signal.

When Demod Audio is selected, the demodulated audio signal appears at this output whenever the Analog Demod application is demodulating a signal or when Analog Demod Tune and Listen is operating in the Swept SA measurement.

When Analog Out is in the Auto state, this output is auto-selected when in the Analog Demod mode or when Analog Demod Tune and Listen is operating in the Swept SA measurement.

If any other Analog Output is manually selected when in the Analog Demod mode or when Analog Demod Tune and Listen is operating in the Swept SA measurement, a condition warning message appears.

Key Path	Input/Output, Output Config, Analog Out
Example	OUTP:ANAL DAUD
Dependencies	This key only appears if the Analog Demod application (N9063A), the N6141A or W6141A application, or Option EMC is installed and licensed, otherwise the key will be blanked and the command will generate an "Option not available" error. The output holds at its last value during an alignment and during a marker count. It is not held between sweeps, in order for Tune and Listen to work properly. When Demod Audio is the selected Analog Output: • all active traces are forced to use the same detector. • CISPR detectors (QPD, EMI Avg, RMS Avg) are unavailable
Readback Text	Demod Audio
Initial S/W Revision	Prior to A.02.00 (this was the default functionality, and there was no selection)
Modified at S/W Revision	A.04.00

Digital Bus

This menu allows you to configure the LVDS connector located on the rear panel of the instrument. It is a unidirectional link of real time data at a 90 MSa/s rate. The ADC is sampling a 22.5 MHz IF.

The data that appears on this port is raw, uncorrected ADC samples, unless you have option RTL. With option RTL, you get fully corrected I/Q data.

This connector will only be active when the Narrowband IF Path is currently in use.

Key Path	Input/Output, Output Config, Digital Out
Initial S/W Revision	A.04.00

Bus Out On/Off

When Bus Out is on, all acquisitions are streamed to the output port including acquisitions for internal purposes such as Alignment; internal processing and

routing of acquisitions continues as usual and is unaffected by the state of Bus Out.

When Bus Out is off, no signal appears on the LVDS port.

Key Path	Input/Output, Output Config, Digital Out, Digital Bus
Scope	Mode Global
Remote Command	`:OUTPut:DBUS[1][:STATe] ON|OFF|1|0` `:OUTPut:DBUS[1][:STATe]?`
Example	OUTP:DBUS ON
Preset	This is unaffected by a Preset but is set to Off on a "Restore Input/Output Defaults" or "Restore System Defaults -> All"
State Saved	Saved in Input/Output State
Initial S/W Revision	Prior to A.02.00
Modified at S/W Revision	A.04.00

Marker

This mode does not have Marker functionality.

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

Marker Function

This mode does not have Marker Function functionality.

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

Marker To

This mode does not have Marker To functionality.

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

Meas

The information in this section is common to all measurements. For key and remote command information for a specific measurement, refer to the section that describes the measurement of interest.

Measurements available under the Meas key are specific to the current Mode.

When viewing Help for measurements, note the following:

NOTE Operation for some keys differs between measurements. The information displayed in Help pertains to the current measurement. To see how a key operates in a different measurement, exit Help (press the Cancel Esc key), select the measurement, then reenter Help (press the Help key) and press that key.

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

Meas Setup

Allows you to change the capture setting and the measurement setting of TX Power, TX Output Spectrum and Mod Accuracy.

The TX power is always “On” and can not be turned “Off”. The TX Output Spectrum and Mod Accuracy are “Off” by default.

NOTE There is no menu displayed under Meas Setup, all the settings under Meas Setup are SCPI only.

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

IF Gain

To take advantage of the instrument's dynamic range, a switchable IF amplifier with approximately 10 dB of gain is employed. When it can be turned on without overloading the instrument the dynamic range is improved. The IF Gain key can be used to set the IF Gain function to Auto, or to On (the extra 10 dB) or Off.

IF Gain Auto

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

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

Key Path	SCPI only
Mode	Combined WLAN
Remote Command	`[:SENSe]:CWLan:IF:GAIN:AUTO[:STATe] OFF|ON|0|1` `[:SENSe]:CWLan:IF:GAIN:AUTO[:STATe]?`
Example	CWL:IF:GAIN:AUTO ON CWL:IF:GAIN:AUTO?

Preset	OFF
State Saved	Saved in instrument state.
Range	On | Off
Initial S/W Revision	A.02.00

IF Gain State

Selects the range of IF gain.

Key Path	SCPI only
Mode	Combined WLAN
Remote Command	`[:SENSe]:CWLan:IF:GAIN[:STATe] ON|OFF|1|0`
	`[:SENSe]:CWLan:IF:GAIN[:STATe]?`
Example	CWL:IF:GAIN OFF
	CWL:IF:GAIN?
Notes	ON = high gain
	OFF = low gain
Preset	OFF
State Saved	Saved in instrument state.
Initial S/W Revision	A.02.00

Capture Setup

Allows you to set the capture parameters for testing, including Burst Number, Burst Type, Capture Offset and Burst Setup.

In any case, maximum of 36 sets of burst data are provided (either by default or by the previous user's settings),

You can specify the settings for each burst using Burst Setup.

Burst Number

Bursts Number specifies how many bursts are to be measured in one capture.

Key Path	SCPI Only

Mode	Combined WLAN
Remote Command	`[:SENSe]:CWLan:CAPTure:BURSt:NUMBer <integer>`
	`[:SENSe]:CWLan:CAPTure:BURSt:NUMBer?`
Example	CWL:CAPT:BURS:NUMB 2
	CWL:CAPT:BURS:NUMB?
Preset	1
State Saved	Saved in instrument state.
Min	1
Max	36
Initial S/W Revision	A.02.00

Burst Type

There are two kinds of burst type: Static and Dynamic.

No matter which burst type you select, each Burst can have different settings for Prefix and Burst. Total capture length is equal to Capture Offset plus the sum of Prefix and Burst of all the bursts.

In Static burst, the capture cannot do frequency and Attenuation hopping, so Suffix of burst has no effect to the capture. The capture will only use the Center Freq of the first burst as the center frequency of the whole capture, the Center Freq parameter of the other bursts will be ignored. The atten is equal to Elec-Atten plus Mech-Atten.

In Dynamic Burst, each burst may have different settings for Center Freq and Burst Atten, the Suffix is used to set the switching time for the Center frequency or E-Atten hopping. Each burst may have different E-Atten based on different settings.

Key Path	SCPI Only
Mode	Combined WLAN
Remote Command	`[:SENSe]:CWLan:CAPTure:BURSt:TYPE STATic|DYNamic`
	`[:SENSe]:CWLan:CAPTure:BURSt:TYPE?`
Example	CWL:CAPT:BURS:TYPE DYN

	CWL:CAPT:BURS:TYPE?
Preset	STATic
State Saved	Saved in instrument state.
Range	Static | Dynamic
Initial S/W Revision	A.02.00

Capture Offset

Capture Offset specifies where the first burst starts after the trigger delay.

Key Path	SCPI Only
Mode	Combined WLAN
Remote Command	`[:SENSe]:CWLan:CAPTure:OFFSet <time>`
	`[:SENSe]:CWLan:CAPTure:OFFSet?`
Example	CWL:CAPT:OFFS 200us
	CWL:CAPT:OFFS?
Preset	0 s
State Saved	Saved in instrument state.
Min	0
Max	1 s
Initial S/W Revision	A.02.00

Burst Setup

Accesses a menu that enables you to set up the parameters for both Static and Dynamic Burst, these settings includes Center Freq, Atten ,Prefix, Burst, Suffix of the whole interval.

The whole burst interval is the sum of Prefix, Burst and Suffix.

Prefix If burst type is Static, prefix is used to define the time spacing between this burst and the previous burst. But if burst type is Dynamic, Prefix is used to represent the measurement start time of each burst.

Burst allows you to specify the data time over which the measurement is made.

Suffix is used to define the hardware switching time between this burst and the next burst.

Center Freq

Specifies the Center Frequency of the bursts. If Burst Type is set to Static, the capture will only use the center frequency of the first burst for the whole capture, the center frequency of all the other bursts will be ignored.

Key Path	SCPI Only
Mode	Combined WLAN
Remote Command	`[:SENSe]:CWLan:CAPTure:BURSt:FREQuency <freq>,<freq>,<freq>,<freq>,<freq>,<freq>,<freq>,<freq>,<freq>,<freq>,<freq>,<fre` `[:SENSe]:CWLan:CAPTure:BURSt:FREQuency?`
Example	CWL:CAPT:BURS:FREQ 30MHz, 30MHz, 30MHz, 30MHz, 30MHz, 30MHz, 30MHz, 30MHz, 30MHz, 30MHz, 30M CWL:CAPT:BURS:FREQ?
Preset	2.412 GHz
State Saved	Saved in instrument state.
Min	–79.999995 MHz
Max	Hardware Dependent: Opt503 = 3.699999995 GHz Opt508 = 8.499999995 GHz Opt513 = 13.799999995 GHz Opt526 = 26.999999995 GHz
Initial S/W Revision	A.02.00

Burst Attenuation

Allows user to set the Electronic Attenuation for all bursts. The value must be 0 or 20.

In Static burst, this parameter will be ignored.

Key Path SCPI Only

Mode Combined WLAN

Remote Command

```
[:SENSe]:CWLan:CAPTure:BURSt:ATTenuation <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>,<rel_ampl>,<rel_ampl>,<rel_ampl>,<rel_ampl>,<rel_ampl>,<rel_ampl>,<rel_ampl>,<rel_ampl>,<rel_ampl>,<rel_ampl>,<rel_ampl>

[:SENSe]:CWLan:CAPTure:BURSt:ATTenuation?
```

Example CWL:CAPT:BURS:ATT 20,20,20,20,20,20,20,20,0,0,0,0,20,20,20,20,20,20,20,20,0,0,0,0,20,20,20,20,20,20,20,20,0,0,0,0

CWL:CAPT:BURS:ATT?

Notes Support 2 values or single value, 20 or 0dB.

If used value 20 in the list, the electric attenuation must be set to 20 (POW:EATT 20).

The first value of the list can't be 0.

Preset 0 dB

State Saved Saved in instrument state.

Min 0

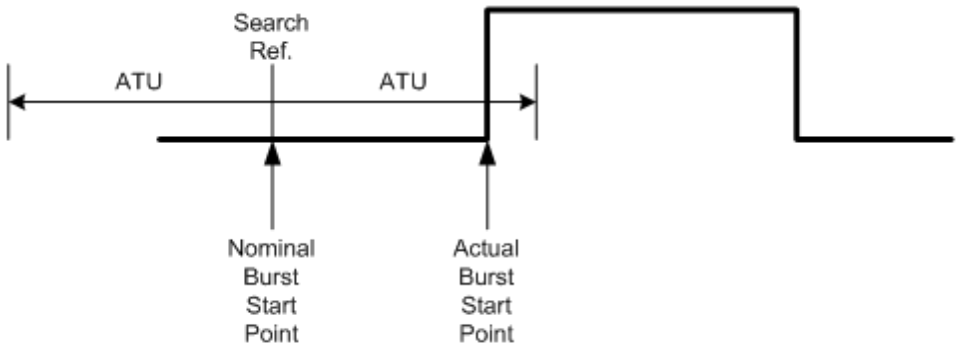
Max 20

Initial S/W Revision A.02.00

Arrival Time Uncertainty

Arrival Time Uncertainty is the parameter to help SA determine the ramp-up side of burst.

Here is an illustration of the ATU time window:



If we capture bursts without Gate, the XA settings of the input signal cannot very exactly match the actual input signal. When the burst start point does not begin at the nominal point due to unpredictable reasons, use the ATU to allow the XA to search for the ramp up side of the burst signal.

Key Path	SCPI Only
Mode	Combined WLAN
Remote Command	`[:SENSe]:CWLan:CAPTure:ATUNcertain <time>`
	`[:SENSe]:CWLan:CAPTure:ATUNcertain?`
Example	CWL:CAPT:ATUN 0.000002
	CWL:CAPT:ATUN?
Preset	0s
State Saved	Saved in instrument state.
Min	0s
Max	3.6ms
Initial S/W Revision	A.02.00

Prefix

Prefix is used to define the time spacing between the current burst and the previous burst under the static mode. It is good practice to set a 2us Prefix under the dynamic burst setting. This allows the RF front input circuitry time to ramp up.

Data capture is actually on during Prefix time, yet the system excludes this data from being processed.

Key Path	SCPI Only
Mode	Combined WLAN
Remote Command	`[:SENSe]:CWLan:CAPTure:BURSt:PREFix <time>,<time>,<time>,<time>,<time>,<time>,<time>,<time>,<time>,<time>,<time>,<ti` `[:SENSe]:CWLan:CAPTure:BURSt:PREFix?`
Example	CWL:CAPT:BURS:PREF 200us,200us, 200us,200us, 200us,200us, 200us,200us, 200us,200us, 200us,200us, 2 CWL:CAPT:BURS:PREF?
Notes	In any cases, the burst 1 doe not have a meaningful Prefix value, the values defined here is use only for defi
Preset	0 us, 0 us, 0 us, 0 us, 0 us, 0 us, 0 us, 0 us, 0 us, 0 us, 0 us, 0 us, 0 us, 0 us, 0 us, 0 us, 0 us, 0 us, 0 us,
State Saved	Saved in instrument state.
Min	0 s
Max	88.5 ms
Initial S/W Revision	A.02.00

Burst

Burst is the duration in which the RF front end captures the target burst. The output results are calculated based on the data captured during this period.

Key Path	SCPI Only
Mode	Combined WLAN
Remote Command	`[:SENSe]:CWLan:CAPTure:BURSt:LOAD <time>,<time>,<time>,<time>,<time>,<time>,<time>,<time>,<time>,<time>,<time>,<ti` `[:SENSe]:CWLan:CAPTure:BURSt:LOAD?`
Example	CWL:CAPT:BURS:LOAD 5ms,5ms, 5ms,5ms, 5ms,5ms, 5ms,5ms, 5ms,5ms, 5ms,5ms, 5ms,5ms, 5ms,5ms, 5 CWL:CAPT:BURS:LOAD?
Notes	If burst length < 3.769508/RBW, settings conflict (ID –221) message will be posted, this RF burst will not be If burst length < EVM required length, settings conflict (ID –221) message will be posted, this RF burst will n If burst type is Dynamic and E-Atten changes, the burst length is better > 100 us.
Preset	1 ms, 1 ms, 1 ms, 1 ms, 1 ms, 1 ms, 1 ms, 1 ms,1 ms, 1 ms, 1 ms, 1 ms, 1 ms, 1 ms, 1 ms, 1 ms, 1 ms, 1 ms,
State Saved	Saved in instrument state.

Min	100 ns
Max	88.5 ms
Initial S/W Revision	A.02.00

Suffix

Suffix is time from the end of the current burst to the start of Prefix of the next burst.

It is important to note that the suffix time actually represents the duration in which the RF front end changes the capturing parameters such as center frequency, electronic attenuations. So the suffix times are supposed to be 0s regardless what is entered under the Static Burst type. It is had better larger than 500 us under the dynamic burst type scenario.

Data capture is suspended during this time, and the final captured raw data does not contain the data corresponding to all the suffix time.

One very important exception is that there is no suffix time for the ending burst.

Key Path	SCPI Only
Mode	Combined WLAN
Remote Command	`[:SENSe]:CWLan:CAPTure:BURSt:SUFFix <time>,<time>,<time>,<time>,<time>,<time>,<time>,<time>,<time>,<time>,<time>,<tim` `[:SENSe]:CWLan:CAPTure:BURSt:SUFFix?`
Example	CWL:CAPT:BURS:SUFF 0s,0s, 0s,0s, 0s,0s, 0s,0s, 0s,5ms, 0s,0s, 0s,0s, 0s,0s, 0s,0s, 0s,0s, 0s,5ms, 0s,0s, 0s,0s CWL:CAPT:BURS:SUFF?
Couplings	Set to 0 when the burst type is static
Preset	0 us, 0
State Saved	Saved in instrument state.
Min	0 s
Max	1 s
Initial S/W Revision	A.02.00

Gate Source

This command defines a list of gate source settings at which the burst type is Dynamic. Trigger Source is the start of a sweep list, and Gate Source is the start of each sweep list point. After using Gate Source, the SA will begin to capture the data of each burst when it detects the rising side of it. For the non-deterministic signal, it is difficult to determine the exactly timing of each burst without Gate Source.

Key Path	SCPI Only
Mode	Combined WLAN
Remote Command	`[:SENSe]:CWLan:CAPTure:BURSt:GATE:SOURce <IMM>,<IMM>,<IMM>,<IMM>,<IMM>,<IMM<IMM>,<IMM>,<IMM>,<IMM>,<IMM>,<IMM>,<IMM>,<IM` `[:SENSe]:CWLan:CAPTure:BURSt:GATE:SOURce?`
Example	CWL:CAPT:BURS:GATE:SOUR IMM,IMM,IMM,IMM,IMM,IMM,IMM,IMM,IMM,IMM,IMM,IMM,IMM,IMM,I CWL:CAPT:BURS:GATE:SOUR?
Notes	One or any two types of Gate Sources can be set. When two sources are set, in accordance with the Ns cycl [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,
State Saved	Saved in instrument state.
Range	IMMediate | EXTernal1 | EXTernal2 | RFBurst | FRAMe
Initial S/W Revision	A.02.00

Average

Switch Average on or off for the TX power measurement result.

When the average is on, the system performs a repeat average against the measured power of burst within the test range.

Key Path	SCPI Only
Mode	Combined WLAN
Remote Command	`[:SENSe]:CWLan:TXPower:AVERage[:STATe] OFF|ON|0|1`
	`[:SENSe]:CWLan:TXPower:AVERage[:STATe]?`
Example	:CWL:TXP:AVER ON
	:CWL:TXP:AVER?
Preset	OFF
State Saved	Saved in instrument state.
Range	On | Off
Initial S/W Revision	A.02.00

Test Range

Specifies the burst range where the TX power measurement is made.

Start Burst

Allows you to specify the Burst Number where the TX power measurement starts.

Start Burst must be equal to or less than the Burst Number.

Key Path	SCPI Only
Mode	Combined WLAN
Remote Command	`[:SENSe]:CWLan:TXPower:BURSt:STARt <integer>`
	`[:SENSe]:CWLan:TXPower:BURSt:STARt?`
Example	CWL:TXP:BURS:STAR 2
	CWL:TXP:BURS:STAR?
Couplings	Max value of Start Burst is equal to the value of Burst Number.
Preset	1
State Saved	Saved in instrument state.

Min	1
Max	Burst Number
Initial S/W Revision	A.02.00

Stop Burst

Allows you to specify the burst number where the TX power measurement stops.

Stop Burst must be equal to or less than Burst Number.

Key Path	SCPI Only
Mode	Combined WLAN
Remote Command	`[:SENSe]:CWLan:TXPower:BURSt:STOP <integer>`
	`[:SENSe]:CWLan:TXPower:BURSt:STOP?`
Example	CWL:TXP:BURSt:STOP 2
	CWL:TXP:BURSt:STOP?
Couplings	Min value of Stop Burst is equal to the value of Start Burst.
	Max value of Stop Burst is equal to the value of Burst Number.
Preset	1
State Saved	Saved in instrument state.
Min	Start Burst
Max	Burst Number
Initial S/W Revision	A.02.00

TX Output Spectrum

Allows you to enable or disable the TX Output Spectrum measurement.

Key Path	SCPI Only
Mode	Combined WLAN
Remote Command	`[:SENSe]:CWLan:TOSPectrum[:ENABle] OFF|ON|0|1`
	`[:SENSe]:CWLan:TOSPectrum[:ENABle]?`
Example	CWL:TOSP ON
	CWL:TOSP?
Preset	OFF

State Saved	Saved in instrument state.
Range	Off | On
Initial S/W Revision	A.02.00

Farther Offset

Allows you to define whether he/she desire to measure the offset spectrum around 50 MHz away from the Center Frequency.

Key Path	SCPI Only
Mode	Combined WLAN
Remote Command	`[:SENSe]:CWLan:TOSPectrum:FOFFset[:STATe] OFF|ON|0|1` `[:SENSe]:CWLan:TOSPectrum:FOFFset[:STATe]?`
Example	:CWL:TOSP:FOFF ON :CWL:TOSP:FOFF?
Preset	OFF
State Saved	Saved in instrument state.
Range	On | Off
Initial S/W Revision	A.02.00

Test Range

Specify the burst range where the TX Output Spectrum measurement is made.

The menu map is the same with Test Range of TX Power Setup

Start Burst

Allows you to specify the Burst Number where the TX Output Spectrum measurement starts.

Start Burst must be equal to or less than the Burst Number.

.

Key Path	SCPI Only
Mode	Combined WLAN
Remote Command	`[:SENSe]:CWLan:TOSPectrum:BURSt:STARt <integer>`

	[:SENSe]:CWLan:TOSPectrum:BURSt:STARt?
Example	CWL:TOSPectrum:BURSt:STARt 2
	CWL:TOSPectrum:BURSt:STARt?
Couplings	Max value of Start Burst is equal to the value of the Burst Number.
Preset	1
State Saved	Saved in instrument state.
Min	1
Max	the Burst Number
Initial S/W Revision	A.02.00

Stop Burst

Allows you to specify the Burst Number where the TX Output Spectrum measurement stops.

And for TX Output Spectrum, value of Stop Burst should be equal to or larger than 3.

Stop Burst must be equal to or less than the Burst Number.

Key Path	SCPI Only
Mode	Combined WLAN
Remote Command	[:SENSe]:CWLan:TOSPectrum:BURSt:STOP <integer>
	[:SENSe]:CWLan:TOSPectrum:BURSt:STOP?
Example	CWL:TOSP:BURS:STOP 6
	CWL:TOSP:BURS:STOP?
Couplings	Min value of Stop Burst is equal to the value of Start Burst.
	Max value of Stop Burst is equal to the Burst Number.
Preset	3
State Saved	Saved in instrument state.
Min	Start Burst
Max	Burst Number
Initial S/W Revision	A.02.00

Limits Level

Allows you to set Transmit Output Spectrum Limit Line of Offset A, B, C, D. If the radio stand is 802.11a or 802.11g-OFDM, Offset A, B, C, D is 9–11MHz, 11–20 MHz, 20–30 MHz, 30–55 MHz. If radio stand is 802.11b or 802.11g-DSSS, Offset A, B, C, D is 11–22 MHz, 22–33 MHz, 33–44 MHz, 44–55 MHz.

Key Path	SCPI Only
Mode	Combined WLAN
Remote Command	`:CALCulate:CWLan:TOSPectrum:LIMit:DATA <rel_ampl>,<rel_ampl>,<rel_ampl>,<rel_ampl>,<rel_ampl>` `:CALCulate:CWLan:TOSPectrum:LIMit:DATA?`
Example	CALC:CWL:TOSP:LIM:DATA –10,–10,–20,–20,–20 CALC:CWL:TOSP:LIM:DATA?
Preset	0 dB, –20dB, -–28dB, –40dB,–50dB (802.11a, 802.11g-OFDM) –30 dB, –50dB, –50dB, –50dB,–50dB (802.11b, 802.11g-DSSS)
State Saved	Saved in instrument state.
Min	–200 dB
Max	50 dB
Initial S/W Revision	A.02.00

Modulation Accuracy

Allows you to set the On/Off status of the Modulation Accuracy measurement.

Key Path	SCPI Only
Mode	Combined WLAN
Remote Command	`[:SENSe]:CWLan:EVM[:ENABle] OFF|ON|0|1` `[:SENSe]:CWLan:EVM[:ENABle]?`
Example	CWL:EVM ON CWLS:EVM?
Preset	OFF
State Saved	Saved in instrument state.
Range	Off|On
Initial S/W Revision	A.02.00

Test Range

Allows you to specify the burst number where the Mod Accuracy measurement is made.

Start Burst

Specifies the Burst Number where the Mod Accuracy measurement starts.

Start Burst must be equal to or less than the Burst Number.

Key Path	SCPI Only
Mode	Combined WLAN
Remote Command	`[:SENSe]:CWLan:EVM:BURSt:STARt <integer>`
	`[:SENSe]:CWLan:EVM:BURSt:STARt?`
Example	CWL:EVM:BURSt:STARt 2
	CWL:EVM:BURSt:STARt?
Couplings	Max value of Start Burst is equal to the Burst Number
Preset	1
State Saved	Saved in instrument state.
Range	1 to Burst Number
Initial S/W Revision	A.02.00

Stop Burst

Allows you to specify the burst number where the Mod Accuracy measurement stops.

Stop Burst must be equal to or less than the Burst Number.

Key Path	SCPI Only
Mode	Combined WLAN
Remote Command	`[:SENSe]:CWLan:EVM:BURSt:STOP <integer>`
	`[:SENSe]:CWLan:EVM:BURSt:STOP?`
Example	CWL:EVM:BURSt:STOP 2
	CWL:EVM:BURSt:STOP?
Couplings	Min value of Stop Burst is equal to the value of Start Burst.

Max value of Stop Burst is equal to the Burst Number.

Preset	1
State Saved	Saved in instrument state.
Min	Frtart Burst
Max	Burst Number
Initial S/W Revision	A.02.00

Meas Time

The following illustration shows the interrelationship between the Search Length, Result Length, Measurement Interval, and Measurement Offset. The Search Length is the total capture length.

11a, or 11f-OFDM:

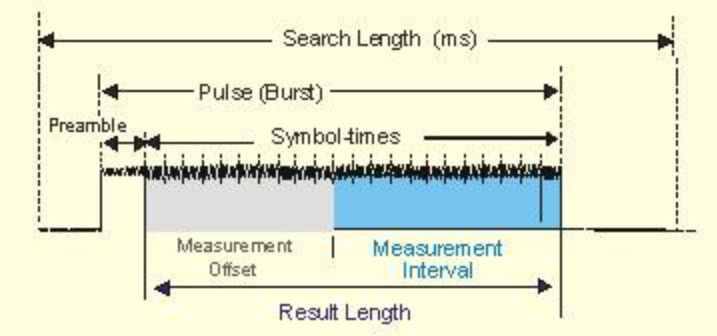


Figure 0-1 Parameter Interrelationship for 802.11a

11b, or 11g-DSSS:

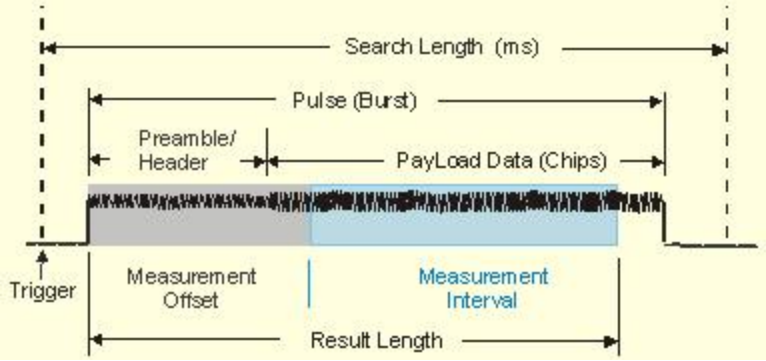


Figure 0-2 Parameter Interrelationship for 802.11b

Meas Interval

802.11a, or 802.11g-OFDM:

This parameterspecifies the measurement interval (length), in symbol times, of the portion of the OFDM burst that will be analyzed. This analyzed portion of the OFDM burst starts at a measurement offset specified by Meas Offset.

802.11b, or 802.11g-DSSS:

Used to set the measurement interval (length), in chips, of the portion of the WLAN burst that will be analyzed. This analyzed portion of the WLAN burst starts at a measurement offset specified by Meas Offset.

Key Path	SCPI Only
Mode	Combined WLAN
Remote Command	`[:SENSe]:CWLan:EVM:TIME:INTerval <integer>`
	`[:SENSe]:CWLan:EVM:TIME:INTerval?`
Example	CWL:EVM:TIM:INT 100symbols
	CWL:EVM:TIM:INT?
Notes	If results length state is Auto,
	Measure Interval Max value = Max Result Length
	If results length state is Man,
	Measure Interval Max value = Result Length
Preset	802.11a, 802.11g-OFDM: 60 symbols
	802.11b, 802.11g-DSSS: 2794 chips
State Saved	Saved in instrument state.
Min	1
Max	802.11a, 802.11g-OFDM: 1397 symbols
	802.11b, 802.11g-DSSS: 96360 chips
Initial S/W Revision	A.02.00

Meas Offset

802.11a, or 802.11g-OFDM:

This parameterspecifies the measurement offset, in symbol times, of the portion of the OFDM burst that will be analyzed. The length of this analyzed portion of the OFDM burst is specified by Meas Interval. If the specified measurement offset is less than zero, a value of zero is used instead.

802.11b, or 802.11g-DSSS:

Used to set the measurement offset, in chips, of the portion of the WLAN burst that will be analyzed. The length of this analyzed portion of the WLAN burst is specified by Meas Interval. If the specified measurement offset is less than zero, a value of zero is used instead.

The measurement interval and offset are relative to the ideal starting point of the PLCP preamble portion of the burst. For a signal that uses the long PLCP format, the ideal starting point of the PLCP preamble is exactly 128 symbol times (128*11 chip times) before the start of the SFD sync pattern. For a signal that uses the short PLCP format, the ideal starting point of the PLCP preamble is exactly 56 symbol times (56*11 chip times) before the start of the SFD sync pattern.

Key Path	SCPI Only
Mode	Combined WLAN
Remote Command	`[:SENSe]:CWLan:EVM:TIME:OFFSet <integer>` `[:SENSe]:CWLan:EVM:TIME:OFFSet?`
Example	CWL:EVM:TIM:OFFS 100symbols CWL:EVM:TIM:OFFS?
Preset	802.11a, 802.11g-OFDM: 0 symbols 802.11b, 802.11g-DSSS: 22 chips
State Saved	Saved in instrument state.
Min	0
Max	If Result Length is Auto, then the specified measurement offset will be clipped to be less than or equal to the value of Max Result Length - Meas Interval, If Result Length is Man, then the specified measurement offset will be clipped to be less than or equal to the value of Result Length - Meas Interval.
Initial S/W Revision	A.02.00

Result Length

When Result Length is Auto, the length of the burst is auto-detected. The result length is determined from the decoded SIGNAL symbol. The value of Max Result Length specifies the maximum result length for the burst; any burst longer than that will be treated as though that were the length of the burst.

When Result Length is Man, you can specify the result length of the burst regardless of the actual length of the burst.

For 802.11n, When Auto is selected, the analyzer automatically determines the measurement result length. It compares the information detected within the High Throughput Signal Field of the High Throughput Preamble to the Error! Hyperlink reference not valid. parameter and uses the smaller value as the measurement result length.

Key Path	SCPI only
Mode	Combined WLAN
Remote Command	`[:SENSe]:CWLan:EVM:TIME:RESult:LENGth <integer>`
	`[:SENSe]:CWLan:EVM:TIME:RESult:LENGth?`
	`[:SENSe]:CWLan:EVM:TIME:RESult[:STATe]:AUTO OFF|ON|0|1`
	`[:SENSe]:CWLan:EVM:TIME:RESult[:STATe]:AUTO?`
Example	CWL:EVM:TIME:RES:LENG 60
	CWL:EVM:TIME:RES:LENG?
	CWL:EVM:TIME:RES:AUTO ON
	CWL:EVM:TIME:RES:AUTO?
Preset	802.11a, 802.11g-OFDM, 802.11n: 60 symbols
	802.11b, 802.11g-DSSS: 2816 chips
	On
State Saved	Saved in instrument state.
Min	1
Max	802.11a, 802.11g-OFDM, 802.11n: 1397 symbols
	802.11b, 802.11g-DSSS: 96360 chips
Initial S/W Revision	A.02.00

Max Result Length

Max Result Length specifies a maximum result length.

If the auto-detected length is greater than the specified maximum result length, the maximum result length is used instead.

The actual results returned will be for a subset of this maximum, as specified by the Meas Interval and Meas Offset, and will be further limited to the auto-detected result length if that is shorter than the maximum result length.

Key Path	SCPI Only
Mode	Combined WLAN
Remote Command	`[:SENSe]:CWLan:EVM:TIME:RESult:MAX <integer>`
	`[:SENSe]:CWLan:EVM:TIME:RESult:MAX?`
Example	CWL:EVM:TIM:RES:MAX 100symbols
	CWL:EVM:TIM:RES:MAX?
Preset	802.11a, 802.11g-OFDM, 802.11n: 60 symbols
	802.11b, 802.11g-DSSS: 2816 chips
State Saved	Saved in instrument state.
Min	1
Max	802.11a, 802.11g-OFDM, 802.11n: 1397 symbols
	802.11b, 802.11g-DSSS: 96360 chips
Initial S/W Revision	A.02.00

Subcarrier

This parameter specifies whether the demodulation results are for all subcarriers in the signal, for a single subcarrier, or for the pilot subcarriers when Radio Std is set to 802.11a ,802.11g-OFDM or 802.11n.

Key Path	SCPI Only
Mode	Combined WLAN
Remote Command	`[:SENSe]:CWLan:EVM:SUBCarrier:SELect ALL|PILot|SINGle`
	`[:SENSe]:CWLan:EVM:SUBCarrier:SELect?`
Example	CWL:EVM:SUBC:SEL SING
	CWL:EVM:SUBC:SEL?
Notes	This key is only available for 802.11a, 802.11g-OFDM, 802.11n Radio Std.
Preset	ALL
State Saved	Saved in instrument state.
Range	All | Pilot | Single
Initial S/W Revision	A.02.00

Subcarrier Number

This parameter specifies the subcarrier to which the demodulation results apply.

Key Path	SCPI Only
Mode	Combined WLAN
Remote Command	`[:SENSe]:CWLan:EVM:SUBCarrier:NUMBer <integer>`
	`[:SENSe]:CWLan:EVM:SUBCarrier:NUMBer?`
Example	CWL:EVM:SUBC:NUMB 2
	CWL:EVM:SUBC:NUMB?
Preset	1
State Saved	Saved in instrument state.
Min	1
Max	52
Initial S/W Revision	A.02.00

Chip Rate

Thisspecifies the fundamental chip rate of the signal to be analyzed. The value should be positive; non-positive values are converted to 1 Hz. The default is 11 MHz, which matches the chip rate of 802.11b/g.

The only special case is the optional 802.11g 33Mbit PBCC mode. In this mode, the chip rate of the transmitted signal starts at 11 MHz, but changes to 16.5 MHz in the middle of the burst. For signals of this type, the CHIP_RATE should still be specified as 11 MHz, and the measurement will automatically switch to 16.5 MHz at the appropriate place in the burst.

Key Path	No equivalent front-panel key
Mode	Combined WLAN
Remote Command	`[:SENSe]:EVM:CHPRate <frequency>`
	`[:SENSe]:EVM:CHPRate?`
Example	:EVM:CHPR 11.0MHz
	:EVM:CHPR?

Preset	11.0 MHz
State Saved	Saved in instrument state.
Min	1MHz
Max	HW DEPENDENT opt. 122:25.0 MHz, opt. 140: 12.5 MHz
Initial S/W Revision	A.02.00

Clock Adjust

In normal measurements, the signal is synchronized to the chip timing. In unusual cases, it is possible for the synchronization to be off slightly. This parameter allows you to specify a timing offset which is added to the chip timing detected. This parameter should only be used when trying to debug unusual signals.

The maximum valid value for this parameter is 0.5 chips, and the minimum valid value is –0.5 chips.

Key Path	No equivalent front-panel key
Mode	Combined WLAN
Remote Command	[:SENSe]:EVM:CLKadj <real> [:SENSe]:EVM:CLKadj?
Example	:EVM:CLK –0.1 :EVM:CLK?
Preset	0.0 chips
State Saved	Saved in instrument state.
Min	–0.5
Max	0.5
Initial S/W Revision	A.02.00

Equalizer Len

This parameter specifies the total length of the equalizer filter's impulse response, in chips.

The minimum valid value for Equalizer Len is 3. The maximum valid value is 99, and also must be less than either Max Result Length or Result Length. The

value must be an odd number. The impulse response is centered, so that it extends (EQ_FILT_LEN–1)/2 chips on either side of t=0.

Key Path	No equivalent front-panel key
Mode	Combined WLAN
Remote Command	`[:SENSe]:EVM:EQUalizer:LENGth <integer>`
	`[:SENSe]:EVM:EQUalizer:LENGth?`
	`[:SENSe]:EVM:EQUalizer[:STATe] OFF|ON| 0|1`
	`[:SENSe]:EVM:EQUalizer[:STATe]?`
Example	:EVM:EQU:LENG 21
	:EVM:EQU:LENG?
	:EVM:EQU ON
	:EVM:EQU ON?
Preset	21 chips
	OFF
State Saved	Saved in instrument state.
Min	3
Max	Min(99, Result length/Max result length)
Initial S/W Revision	A.02.00

Descramble

This parameter specifies what type of descrambling to do when producing bitvector results. The valid values are: On, Off, Preamble Only, Preamble & Header Only. OFF means no descrambling is done at all. Preamble Only means only the PLCP preamble is descrambled. Preamble & Header Only means that the PLCP preamble and PLCP header are descrambled. ON means that all parts of the burst are descrambled.

Normally, an 802.11b/g signal has all bits scrambled before transmission, so normally you would want to descramble all of the bitvector results. However, when debugging an 802.11b/g transmitter, it is sometimes helpful to disable scrambling in the transmitter, in which case you would disable descrambling.

Key Path	No equivalent front-panel key
Mode	Combined WLAN
Remote Command	`[:SENSe]:EVM:PREamble ALL|NONE|PONLy|PHONly`

	`[:SENSe]:EVM:PREamble?`
Example	:EVM:PRE NONE
	:EVM:PRE?
Preset	ALL
State Saved	Saved in instrument state.
Range	All | None | Preamble Only |Preamble & Header Only
Initial S/W Revision	A.02.00

Meas Filter

This parameter controls the measurement filter type used for computing EVM.

Key Path	SCPI Only
Mode	Combined WLAN
Remote Command	`[:SENSe]:CWLan:EVM:FILTer:MEASurement NONE|RRCosine`
	`[:SENSe]:CWLan:EVM:FILTer:MEASurement?`
Example	CWL:EVM:FILT:MEAS RRC
	CWL:EVM:FILT:MEAS?
State Saved	Saved in instrument state.
Range	None|RRC
Initial S/W Revision	A.02.00

Ref Filter

This parameter controls the measurement filter type used for computing EVM.

Key Path	SCPI Only
Mode	Combined WLAN
Remote Command	`[:SENSe]:CWLan:EVM:FILTer:REFerence GAUSsian | RECTangle | RCOSine`
	`[:SENSe]:CWLan:EVM:FILTer:REFerence?`
Example	CWL:EVM:FILT:REF RCOS
	CWL:EVM:FILT:REF?
Notes	This key is only available for 802.11b, 802.11g-DSSS Radio Std.

Preset	RECT
State Saved	Saved in instrument state.
Range	Rect | Gaussion | Raised Consine
Initial S/W Revision	A.02.00

Alpha/BT

This parameter is used only when the Ref Filter is set to "GAUSSIAN" or “Raised Cosine”, or the measurement filter is set to “RRC”. In these cases, this parameter controls the BT value for the Gaussian filter and alpha values for Raised Cosine and RRC filters.

Key Path	SCPI Only
Mode	Combined WLAN
Remote Command	`[:SENSe]:CWLan:EVM:FILTer:ALPHa <real>`
	`[:SENSe]:CWLan:EVM:FILTer:ALPHa?`
Example	CWL:EVM:FILT:ALPH 1
	CWL:EVM:FILT:ALPH?
Notes	This key is only available for 802.11b, 802.11g-DSSS Radio Std.
Preset	0.5
State Saved	Saved in instrument state.
Min	0.05
Max	When Reference Filter is set to Gaussian:100.0
	When Reference Filter is set to Raised Cosine: 1.0
Initial S/W Revision	A.02.00

Modulation Format

Allows you to specify the demodulation format to use. Modulation format is automatically set when a radio standard is selected. You can also specify a modulation format for your testing.

Key Path	SCPI only

Mode	Combined WLAN
Remote Command	`[:SENSe]:CWLan:EVM:DEMod AUTO |BPSK|QPSK|QAM16|QAM64|QAM256`
	`[:SENSe]:CWLan:EVM:DEMod?`
Example	:CWL:EVM:DEM AUTO
	:CWL:EVM:DEM?
Preset	AUTO
State Saved	Saved in instrument state.
Range	802.11a, 802.11g-OFDM: AUTO Dectect |BPSK|QPSK|QAM16|QAM64
	802.11b, 802.11g-DSSS: AUTO Dectect | DSSS 1Mbps | DSSS 2Mbps | CCK 5.5Mbps | CCK 11Mbps | PBCC 5.5Mbps | PBCC 11Mbps | PBCC 22Mbps | PBCC 33Mbps
	802.11n: AUTO Dectect |BPSK|QPSK|QAM16|QAM64|QAM256|HTS
Initial S/W Revision	A.02.00

Symbol Timing Adjust

Normally, when demodulating of an OFDM symbol, the guard interval is skipped over, and an FFT is performed on the last portion of the symbol time. However, this means that the FFT would include the transition region between this symbol and the following symbol. To avoid this, it is generally beneficial to back up away from the end of the symbol time, and use a part of the guard interval.

Symbol Timing Adjust controls how far the FFT part of the symbol is adjusted away from the end of the symbol time. The value is in terms of percent of the used (FFT) part of the symbol time. The value must be between zero (meaning no adjustment) and (–100 * Guard Interval). Values outside of that range are clipped to the limit. Note that this parameter value is negative, because the FFT start time is moved back by this parameter.

Key Path	SCPI only
Mode	Combined WLAN
Remote Command	`[:SENSe]:CWLan:EVM:TADJust <percent>`
	`[:SENSe]:CWLan:EVM:TADJust?`

Example	CWL:EVM:TADJ –3.125
	CWL:EVM:TADJ?
Couplings	if guard interval equal to 1/32, the symbol time adjust value be set to –1.5625%.
Preset	–3.125
State Saved	Saved in instrument state.
Min	–100 * guard interval
Max	0.0
Initial S/W Revision	A.02.00

Pilot Track

These parameters specifies how to track the pilot.

Track Amplitude

This parameter specifies whether the demodulation will track the pilot amplitude over the course of the OFDM burst.

Key Path	SCPI only
Mode	Combined WLAN
Remote Command	`[:SENSe]:CWLan:EVM:TRACk:AMP OFF|ON|0|1`
	`[:SENSe]:CWLan:EVM:TRACk:AMP?`
Example	:CWL:EVM:TRAC:AMP OFF
	:CWL:EVM:TRAC:AMP?
Preset	OFF
State Saved	Saved in instrument state.
Range	On | Off
Initial S/W Revision	A.02.00

Track Phase

This parameter specifies whether the demodulation will track the pilot phase over the course of the OFDM burst.

Key Path	SCPI only
Mode	Combined WLAN

Remote Command	`[:SENSe]:CWLan:EVM:TRACk:PHASe OFF|ON|0|1`
	`[:SENSe]:CWLan:EVM:TRACk:PHASe?`
Example	:CWL:EVM:TRAC:PHAS ON
	:CWL:EVM:TRAC:PHAS?
Preset	802.11a, 802.11g-OFDM: ON
	802.11b, 802.11g-DSSS: OFF
State Saved	Saved in instrument state.
Range	On | Off
Initial S/W Revision	A.02.00

Track Timing

This parameter specifies whether the demodulation will track the pilot timing over the course of the OFDM burst.

Key Path	SCPI only
Mode	Combined WLAN
Remote Command	`[:SENSe]:CWLan:EVM:TRACk:TIMing OFF|ON|0|1`
	`[:SENSe]:CWLan:EVM:TRACk:TIMing?`
Example	:CWL:EVM:TRAC:TIM OFF
	:CWL:EVM:TRAC:TIM?
Preset	OFF
State Saved	Saved in instrument state.
Range	On | Off
Initial S/W Revision	A.02.00

Equalizer Training

This specifies how the equalizer is initialized, or "trained". The valid values are Channel Estimation Seq Only and Channel Estimation Seq & Data. The value Channel Estimation Seq Only, which is the default, specifies that the equalizer is trained using only the channel estimation sequence (also called the "long sync") portion of the burst preamble. The 802.11a/g standards imply that the equalizer should be implemented this way when measuring EVM, and this matches how a real receiver would probably implement an equalizer.

The value Channel Estimation Seq & Data specifies that the equalizer should be trained using both the channel estimation sequence and the entire data portion of the burst. This usually gives a more accurate estimate of the equalizer response. It also typically lowers the EVM by one or two dB.

Key Path	SCPI only
Mode	Combined WLAN
Remote Command	`[:SENSe]:CWLan:EVM:EQUalizer:TRAining SEQ|SDATa` `[:SENSe]:CWLan:EVM:EQUalizer:TRAining?`
Example	:CWL:EVM:EQU:TRA SEQ :CWL:EVM:EQU:TRA?
Preset	SEQ
State Saved	Saved in instrument state.
Range	Channel Estimation Seq Only | Channel Estimation Seq & Data
Initial S/W Revision	A.02.00

EVM Threshold Upper

If a user want to do EVM in some range of Tx Power, and this parameter is the upper limit of TxPower. If measured TxPower of the corresponding burst great than this value, the EVM of the burst will not be computed.

Key Path	SCPI Only
Mode	Combined WLAN
Remote Command	`:CALCulate:CWLan:EVM:BURSt:THReshold:UPPer <ampl>,<ampl>,<ampl>,<ampl>,<ampl>,<ampl>,<ampl>,<ampl>,<ampl>,<ampl>,<ampl>,<ar` `:CALCulate:CWLan:EVM:BURSt:THReshold:UPPer?`
Preset	30 dBm, 30 dBm, 30 dBm, 30 dBm, 30 dBm, 30 dBm, 30 dBm, 30 dBm, 30 dBm, 30 dBm, 30 dBm, 30 dBm, 30
State Saved	Saved in instrument state.
Min	–998 dBm
Max	999 dBm
Initial S/W Revision	A.02.00

EVM Threshold Lower

If a user want to do EVM in some range of Tx Power, and this parameter is the lower limit of TxPower. If measured TxPower of the corresponding burst less than this value, the EVM of the burst will not be computed.

If the TX Power of one burst is not measured, but user still want to get EVM result for this burst, the EVM Threshold Lower value of this burst must be set to –999 dBm.

Key Path	SCPI Only
Mode	Combined WLAN
Remote Command	`:CALCulate:CWLan:EVM:BURSt:THReshold:LOWer <ampl>,<ampl>,<ampl>,<ampl>,<ampl>,<ampl>,<ampl>,<ampl>,<ampl>,<ampl>,<amp` `:CALCulate:CWLan:EVM:BURSt:THReshold:LOWer?`
Preset	–999 dBm, –999 dBm, –999 dBm, –999 dBm, –999 dBm, –999 dBm, –999 dBm, –999 dBm, –999 dBm, –999 dB 999 dBm, –999 dBm, –999 dBm, –999 dBm, –999 dBm, –999 dBm
State Saved	Saved in instrument state.
Min	–999 dBm
Max	998 dBm
Initial S/W Revision	A.02.00

Mirror Spectrum

If this parameter is set to Invert, the input time data will be conjugated. Sets Mirror Spectrum to conjugate the input time data before any processing of the signal. This will mirror the frequency spectrum of the input data around the center frequency. Most results are computed in the same way after this frequency mirroring, but the exception is the Freq Error. This result is computed relative to the original unmodified input signal.

Key Path	SCPI Only
Mode	Combined WLAN
Remote Command	`[:SENSe]:CWLan:EVM:SPECtrum NORMal|INVert`

	[:SENSe]:CWLan:EVM:SPECtrum?
Example	:CWL:EVM:SPEC INV
	:CWL:EVM:SPEC?
Preset	NORM
State Saved	Saved in instrument state.
Range	Normal|Invert
Initial S/W Revision	A.02.00

Guard Interval

IEEE 802.11 n supports multiple Guard Interval implementations.

Key Path	SCPI only
Mode	Combined WLAN
Remote Command	[:SENSe]:CWLan:EVM:GINTerval:RATio R1BY8|R1BY4|HTS
	[:SENSe]:CWLan:EVM:GINTerval:RATio?
Example	CWL:EVM:GINT:RAT R1BY8
	CWL:EVM:GINT:RAT?
Preset	R1BY4
State Saved	Saved in instrument state.
Range	1/8|1/4|HTS

FFT size

The FFT Size parameter specifies the fast Fourier transform size. The Error! Hyperlink reference not valid. value for P802.11n HT 20 MHz is 64. The Preset to Standard value for P802.11n HT 40 MHz is 128.

Key Path	SCPI only
Mode	Combined WLAN

Remote Command	`[:SENSe]:CWLan:EVM:NFFT <integer>`
	`[:SENSe]:CWLan:EVM:NFFT?`
Example	CWL:EVM:NFFT 128
	CWL:EVM:NFFT?
Preset	64
State Saved	Saved in instrument state.
Range	64|128
Text MIN/MAX/DEF	Yes

Meas Method

Allows you to select different measurement methods based on your specific needs.

The main difference is the equivalent RBW that a user can choose in order to decide the minimum capture time

The following formula is used to calculate the minimum capture time:

Minimum capture time = k/RBW

In the equation k is the window factor and its value is 3.765908. A larger RBW value corresponds to fast speed with less accuracy, while smaller RBW results in better accuracy with slower speed. You can select one of the following 3 RBWs options for your measurement needs.

Best Speed, RBW = 400 kHz, for priority on measurement speed.

Balanced, RBW = 200 kHz, for priority on balanced performance.

Best Accuracy, RBW = 100 kHz, for priority on accuracy.

Key Path	SCPI Only
Mode	Combined WLAN
Remote Command	`[:SENSe]:CWLan:METHod FAST|BALanced|ACCuracy`
	`[:SENSe]:CWLan:METHod?`

Example	:CWL:METH ACC
	:CWL:METH?
Preset	ACCuracy
Preset	ACCuracy
State Saved	Saved in instrument state.
Range	Fast | Balanced | Best Accuracy
Initial S/W Revision	A.02.00

RF Trace Display

If RF Trace Display is switched to on, the RF Trace is displayed to allow for the alignment of the signal by RF envelop view.

If RF Trace Display is switched to off, the measurement speed will be faster as the RF trace is not reconstructed and RF Envelop view will not update the trace during the measurement.

This is a SCPI only command.

Key Path	SCPI only
Mode	Combined WLAN
Remote Command	`[:SENSe]:CWLan:TRACe:RF[:ENABle] OFF|ON|0|1`
	`[:SENSe]:CWLan:TRACe:RF[:ENABle]?`
Example	:CWL:TRAC:RF ON
	:CWL:TRAC:RF?
Preset	ON
State Saved	Saved in instrument state.
Range	Off|On
Initial S/W Revision	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.

Key Path	SCPI Only
Mode	Combined WLAN
Remote Command	`:CONFigure:CWLan`
Example	:CONF:CWLan
Initial S/W Revision	A.02.00

Mode

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

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

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

For more information on Modes, preloading Modes, and memory requirements for Modes, see "More Information" on page 4-112

Key Path	Front panel key
Remote Command	`:INSTrument[:SELect] SA | SEQAN | EMI | BASIC | WCDMA | EDGEGSM | WIMAXOFDMA | VSA | PNOISE | NFIGURE | ADEMOD | BT | TDSCDMA | CDMA2K | CDMA1XEV | LTE | LTETDD | DVB | DTMB | DCATV | ISDBT | CMMB | CWLAN | CWIMAXOFDM | WIMAXFIXED | IDEN | RLC | SCPILC | VSA89601` `:INSTrument[:SELect]?`
Example	:INST SA
Notes	The available parameters are dependent upon installed and licensed applications resident in the instrument. Parameters given here are an example, specific parameters are in the individual Application. A list of the valid mode choices is returned with the INST:CAT? Query.
Preset	Not affected by Preset. Set to SA following Restore System Defaults, if SA is the default mode.
State Saved	Saved in instrument state
Backwards Compatibility SCPI	`:INSTrument[:SELect] GSM` provided forbackwards compatibility. Mapped to EDGEGSM.
Backwards Compatibility SCPI	`:INSTrument[:SELect] SANalyzer` provided for ESU compatibility. When this command is received, the analyzer aliases it to

	the following: `INST:SEL SCPILC` This results in the analyzer being placed in SCPI Language Compatibility Mode, in order to emulate the ESU Spectrum Analyzer Mode.

Backwards Compatibility SCPI	`:INSTrument[:SELect] RECeiver`
	provided for ESU compatibility. When this command is received, the analyzer aliases it to the following:
	`:INST:SEL EMI`
	`:CONF FSC`
	This results in the analyzer being placed in the EMI Receiver Mode, running the Frequency Scan measurement, in order to emulate the ESU Receiver Mode.

Initial S/W Revision	Prior to A.02.00
Modified at S/W Revision	A.10.01

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

More Information

The Mode name appears on the banner after the word "Agilent" followed by the Measurement Title. For example, for the Spectrum Analyzer mode with the Swept Sa measurement running:

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

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

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

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

1. Close and restart the analyzer program without changing your configured preloads. This may free up enough memory to load the requested Mode, depending on your configured preloads

2. Clear out all preloads and close and restart the analyzer program with only the requested application preloaded, and with that application running. This choice is guaranteed to allow you to run the requested application; but you will lose your previously configured preloads. In addition, there may be little or no room for other applications, depending on the size of the requested application.

3. Bring up the Configure Applications utility in order to reconfigure the preloaded apps to make room for the applications you want to run (this will then require restarting the analyzer program with your new configuration). This is the recommended choice because it gives you full flexibility to select exactly what you want.

4. Exit the dialog box without doing anything, which means you will be unable to load the application you requested.

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

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

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

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

Spectrum Analyzer

Selects the Spectrum Analyzer mode for general purpose measurements. There are several measurements available in this mode. General spectrum analysis measurements, in swept and zero span, can be done using the first key in the Meas menu, labeled Swept SA. Other measurements in the Meas Menu are designed to perform specialized measurement tasks, including power and demod measurements.

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

Key Path	Mode
Example	INST:SEL SA
	INST:NSEL 1
Initial S/W Revision	Prior to A.02.00

IQ Analyzer (Basic)

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

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

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

W-CDMA with HSPA+

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

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

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

GSM/EDGE/EDGE Evo

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

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

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

802.16 OFDMA (WiMAX/WiBro)

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

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

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

Vector Signal Analyzer (VXA)

The N9064A (formerly 89601X) VXA Vector signal and WLAN modulation analysis application provides solutions for basic vector signal analysis, analog demodulation, digital demodulation and WLAN analysis. The digital demodulation portion of N9064A allows you to perform measurements on standard-based formats such as cellular, wireless networking and digital video as well as general purpose flexible modulation analysis for wide range of digital formats, FSK to 1024QAM, with easy-to-use measurements and display tools such as constellation and eye diagram, EVM traces and up to four simultaneous displays. The WLAN portion of N9064A allows you to make RF transmitter measurements on 802.11a/b/g/p/j WLAN devices. Analog baseband analysis is available using the MXA with option BBA.

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

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

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

Phase Noise

The Phase Noise mode provides pre-configured measurements for making general purpose measurements of device phase noise.

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

Key Path	Mode
Example	INST:SEL PNOISE
	or
	INST:NSEL 14
Initial S/W Revision	Prior to A.02.00

Noise Figure

The Noise Figure mode provides pre-configured measurements for making general purpose measurements of device noise figure.

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

Key Path	Mode
Example	INST:SEL NFIGURE

	Or
	INST:NSEL 219
Initial S/W Revision	Prior to A.02.00

Analog Demod

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

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

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

TD-SCDMA with HSPA/8PSK

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

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

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

cdma2000

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

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

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

1xEV-DO

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

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

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

LTE

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

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

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

DVB-T/H with T2

Selects the DVB-T/H mode for measurements of digital video signals using this format. There are several power and demod measurements available in this mode.

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

Key Path	Mode
Example	INST:SEL DVB
	INST:NSEL 235
Initial S/W Revision	A.02.00
Modified at S/W Revision	A.07.00

DTMB (CTTB)

Selects the DTMB (CTTB) mode for measurements of digital video signals using this format. There are several power and demod measurements available in this mode.

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

Key Path	Mode
Example	INST:SEL DTMB
	INST:NSEL 236
Initial S/W Revision	A.02.00

ISDB-T

Selects the ISDB-T mode for measurements of digital video signals using this format. There are several power and demod measurements available in this mode.

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

Key Path	Mode
Example	INST:SEL ISDBT
	INST:NSEL 239
Initial S/W Revision	A.03.00

CMMB

Selects the CMMB mode for measurements of digital video signals using this format. There are several power and demod measurements available in this mode.

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

Key Path	Mode
Example	INST:SEL CMMB
	INST:NSEL 240
Initial S/W Revision	A.03.00

Combined WLAN

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

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

Key Path	Mode
Example	INST:SEL CWLAN
	INST:NSEL 19
Initial S/W Revision	A.02.00

Combined Fixed WiMAX

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

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

Key Path	Mode
Example	INST:SEL CWIMAXOFDM
	INST:NSEL 81
Initial S/W Revision	A.02.00

802.16 OFDM (Fixed WiMAX)

Selects the 802.16 OFDM (Fixed WiMAX) mode. This mode allows modulation quality measurements of signals that comply with IEEE 802.16a–2003 and IEEE 802.16–2004 standards, with flexibility to measure nonstandard OFDM formats. Along with the typical digital demodulation measurement results, several additional 802.16 OFDM unique trace data formats and numeric error data results provide enhanced data analysis.

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

Key Path	Mode
Example	INST:SEL WIMAXFIXED
	INST:NSEL 104
Initial S/W Revision	A.02.00

iDEN/WiDEN/MOTOTalk

Selects the iDEN/WiDEN/MOTOTalk mode for general purpose measurements of iDEN and iDEN-related signals. There are several measurements available in this mode.

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

Key Path	Mode
Example	INST:SEL IDEN
	INST:NSEL 103
Initial S/W Revision	A.02.00

Remote Language Compatibility

The Remote Language Compatibility (RLC) mode provides remote command backwards compatibility for the 8560 series of spectrum analyzers, known as legacy spectrum analyzers.

NOTE After changing into or out of this mode, allow a 1 second delay before sending any subsequent commands.

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

Key Path	Mode
Example	INST:SEL RLC
	Or
	INST:NSEL 266
Initial S/W Revision	Prior to A.02.00

SCPI Language Compatibility

The SCPI Language Compatibility mode provides remote language compatibility for SCPI-based instruments, such as the Rohde and Schwartz FSP and related

series of spectrum analyzers.

NOTE After changing into or out of this mode, allow a 1 second delay before sending any subsequent commands.

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

Key Path	Mode
Example	INST:SEL SCPILC
	Or
	INST:NSEL 270
Initial S/W Revision	A.06.00

89601 VSA

Selecting the 89601 VSA mode will start the 89600-Series VSA software application. The 89600 VSA software is powerful, PC-based software, offering the industry's most sophisticated general purpose and standards specific signal evaluation and troubleshooting tools for the R&D engineer. Reach deeper into signals, gather more data on signal problems, and gain greater insight.

For more information see the Agilent 89600 Series VSA web site at www.agilent.com/find/89600

To learn more about how to use the 89600 VSA running in the X-Series, after the 89600 VSA application is running, open the 89600 VSA Help and open the "About Agilent X-Series Signal Analyzers (MXA/EXA) with 89600-Series Software" help topic.

Key Path	Mode
Example	INST:SEL VSA89601
	INST:NSEL 101
Initial S/W Revision	Prior to A.02.00

Bluetooth

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

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

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

Application Mode Number Selection (Remote Command Only)

Select the measurement mode by its mode number. The actual available choices depend upon which applications are installed in your instrument. The modes appear in this table by NSEL number, which is not the same as their order in the Mode menu (see Error! Reference source not found. for the mode order).

Mode	:INSTrument:NSELect <integer>	:INSTrument[:SELect] <parameter>
Spectrum Analyzer	1	SA
I/Q Analyzer (Basic)	8	BASIC
WCDMA with HSPA+	9	WCDMA
cdma2000	10	CDMA2K
GSM/EDGE/EDGE Evo	13	EDGEGSM
Phase Noise	14	PNOISE
1xEV-DO	15	CDMA1XEV
Combined WLAN	19	CWLAN
802.16 OFDMA (WiMAX/WiBro)	75	WIMAXOFDMA
Combined Fixed WiMAX	81	CWIMAXOFDM
Vector Signal Analyzer (VXA)	100	VSA
89601 VSA	101	VSA89601
LTE	102	LTE

iDEN/WiDEN/MotoTalk	103	IDEN
802.16 OFDM (Fixed WiMAX)	104	WIMAXFIXED
LTE TDD	105	LTETDD
EMI Receiver	141	EMI
TD-SCDMA with HSPA/8PSK	211	TDSCDMA
Noise Figure	219	NFIGURE
Bluetooth	228	BT
Analog Demod	234	ADEMOD
DVB-T/H with T2	235	DVB
DTMB (CTTB)	236	DTMB
Digital Cable TV	238	DCATV
ISDB-T	239	ISDBT
CMMB	240	CMMB
Remote Language Compatibility	266	RLC
SCPI Language Compatibility	270	SCPILC
Sequence Analyzer	400	SEQAN

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

Application Mode Catalog Query (Remote Command Only)

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

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

Application Identification (Remote Commands Only)

Each entry in the Mode Menu will have a Model Number and associated information: Version, and Options.

This information is displayed in the Show System screen. The corresponding SCPI remote commands are defined here.

Current Application Model

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

Remote Command	`:SYSTem:APPLication[:CURRent][:NAME]?`
Example	:SYST:APPL?
Notes	Query returns a quoted string that is the Model Number of the currently selected application (Mode). Example: "N9060A" String length is 6 characters.

Preset	Not affected by Preset
State Saved	Not saved in state, the value will be the selected application when a Save is done.
Initial S/W Revision	Prior to A.02.00

Current Application Revision

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

Remote Command	`:SYSTem:APPLication[:CURRent]:REVision?`
Example	:SYST:APPL:REV?
Notes	Query returns a quoted string that is the Revision of the currently selected application (Mode). Example: "1.0.0.0" String length is a maximum of 23 characters. (each numeral can be an integer + 3 decimal points)

Preset	Not affected by a Preset
State Saved	Not saved in state, the value will be the selected application when a Save is done.
Initial S/W Revision	Prior to A.02.00

Current Application Options

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

Remote Command	`:SYSTem:APPLication[:CURRent]:OPTion?`
Example	:SYST:APPL:OPT?
Notes	Query returns a quoted string that is the Option list of the currently selected application (Mode). The format is the name as the *OPT? or SYSTem:OPTion command: a comma separated list of option identifiers. Example: "1FP,2FP"

	String length is a maximum of 255 characters.
Preset	Not affected by a Preset
State Saved	Not saved in state per se, the value will be the selected application when a Save is invoked.
Initial S/W Revision	Prior to A.02.00

Application Identification Catalog (Remote Commands Only)

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

Application Catalog number of entries

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

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

Application Catalog Model Numbers

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

Remote Command	`:SYSTem:APPLication:CATalog[:NAME]?`
Example	:SYST:APPL:CAT?
Notes	Returned value is a quoted string of a comma separated list of Model Numbers. Example, if SAMS and Phase Noise are installed and licensed: "N9060A,N9068A" String length is COUNt * 7 – 1. (7 = Model Number length + 1 for comma. –1 = no comma for the 1st entry.)

Preset	Not affected by a Preset
State Saved	Not saved in instrument state.
Initial S/W Revision	Prior to A.02.00

Application Catalog Revision

Returns the Revision of the provided Model Number.

Remote Command	`:SYSTem:APPLication:CATalog:REVision? <model>`
Example	:SYST:APPL:CAT:REV? 'N9060A'
Notes	Returned value is a quoted string of revision for the provided Model Number. The revision will be a null-string ("") if the provided Model Number is not installed and licensed. Example, if SAMS is installed and licensed: "1.0.0.0"

Preset	Not affected by a Preset.
State Saved	Not saved in instrument state.
Initial S/W Revision	Prior to A.02.00

Application Catalog Options

Returns a list of Options for the provided Model Number

Remote Command	`:SYSTem:APPLication:CATalog:OPTion? <model>`
Example	:SYST:APPL:CAT:OPT? 'N9060A'
Notes	Returned value is a quoted string of a comma separated list of Options, in the same format as *OPT? or :SYSTem:OPTion?. If the provided Model Number is not installed and licensed a null-string ("") will be returned. Example, if SAMS is installed and licensed: "2FP" String length is a maximum of 255 characters.

Preset	Not affected bya Preset
State Saved	Not saved in instrument state.
Initial S/W Revision	Prior to A.02.00

Spectrum Analyzer

Selects the Spectrum Analyzer mode for general purpose measurements. There are several measurements available in this mode. General spectrum analysis measurements, in swept and zero span, can be done using the first key in the Meas menu, labeled Swept SA. Other measurements in the Meas Menu are designed to perform specialized measurement tasks, including power and demod measurements.

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

Key Path	Mode
Example	INST:SEL SA
	INST:NSEL 1
Initial S/W Revision	Prior to A.02.00

EMI Receiver

The EMI Receiver Mode makes EMC measurements. Several measurements are provided to aid the user in characterizing EMC performance of their systems, including looking at signals with CISPR–16 compliant detectors, performing scans for interfering signals, and determining and charting interfering signals over time.

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

Key Path	Mode
Example	INST:SEL EMI
	INST:NSEL 141
Initial S/W Revision	A.07.01

IQ Analyzer (Basic)

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

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

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

W-CDMA with HSPA+

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

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

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

GSM/EDGE/EDGE Evo

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

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

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

802.16 OFDMA (WiMAX/WiBro)

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

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

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

Vector Signal Analyzer (VXA)

The N9064A (formerly 89601X) VXA Vector signal and WLAN modulation analysis application provides solutions for basic vector signal analysis, analog demodulation, digital demodulation and WLAN analysis. The digital demodulation portion of N9064A allows you to perform measurements on standard-based formats such as cellular, wireless networking and digital video

as well as general purpose flexible modulation analysis for wide range of digital formats, FSK to 1024QAM, with easy-to-use measurements and display tools such as constellation and eye diagram, EVM traces and up to four simultaneous displays. The WLAN portion of N9064A allows you to make RF transmitter measurements on 802.11a/b/g/p/j WLAN devices. Analog baseband analysis is available using the MXA with option BBA.

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

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

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

Phase Noise

The Phase Noise mode provides pre-configured measurements for making general purpose measurements of device phase noise.

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

Key Path	Mode
Example	INST:SEL PNOISE
	or
	INST:NSEL 14
Initial S/W Revision	Prior to A.02.00

Noise Figure

The Noise Figure mode provides pre-configured measurements for making general purpose measurements of device noise figure.

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

Key Path	Mode
Example	INST:SEL NFIGURE
	Or
	INST:NSEL 219
Initial S/W Revision	Prior to A.02.00

Analog Demod

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

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

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

Bluetooth

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

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

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

TD-SCDMA with HSPA/8PSK

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

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

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

cdma2000

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

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

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

1xEV-DO

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

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

Key Path	Mode
Example	INST:SEL CDMA1XEV

	INST:NSEL 15
Initial S/W Revision	Prior to A.02.00

LTE

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

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

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

LTE TDD

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

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

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

DVB-T/H with T2

Selects the DVB-T/H mode for measurements of digital video signals using this format. There are several power and demod measurements available in this

mode.

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

Key Path	Mode
Example	INST:SEL DVB
	INST:NSEL 235
Initial S/W Revision	A.02.00
Modified at S/W Revision	A.07.00

DTMB (CTTB)

Selects the DTMB (CTTB) mode for measurements of digital video signals using this format. There are several power and demod measurements available in this mode.

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

Key Path	Mode
Example	INST:SEL DTMB
	INST:NSEL 236
Initial S/W Revision	A.02.00

Digital Cable TV

Selects the Digital Cable TV mode for measurements of digital cable television systems. There are several power and demod measurements available in this mode.

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

Key Path	Mode

Example	INST:SEL DCATV
	INST:NSEL 238
Initial S/W Revision	A.07.00

ISDB-T

Selects the ISDB-T mode for measurements of digital video signals using this format. There are several power and demod measurements available in this mode.

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

Key Path	Mode
Example	INST:SEL ISDBT
	INST:NSEL 239
Initial S/W Revision	A.03.00

CMMB

Selects the CMMB mode for measurements of digital video signals using this format. There are several power and demod measurements available in this mode.

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

Key Path	Mode
Example	INST:SEL CMMB
	INST:NSEL 240
Initial S/W Revision	A.03.00

Combined WLAN

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

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

Key Path	Mode
Example	INST:SEL CWLAN
	INST:NSEL 19
Initial S/W Revision	A.02.00

Combined Fixed WiMAX

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

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

Key Path	Mode
Example	INST:SEL CWIMAXOFDM
	INST:NSEL 81
Initial S/W Revision	A.02.00

802.16 OFDM (Fixed WiMAX)

Selects the 802.16 OFDM (Fixed WiMAX) mode. This mode allows modulation quality measurements of signals that comply with IEEE 802.16a–2003 and IEEE 802.16–2004 standards, with flexibility to measure nonstandard OFDM formats. Along with the typical digital demodulation measurement results, several additional 802.16 OFDM unique trace data formats and numeric error data results provide enhanced data analysis.

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

Key Path	Mode
Example	INST:SEL WIMAXFIXED
	INST:NSEL 104
Initial S/W Revision	A.02.00

iDEN/WiDEN/MOTOTalk

Selects the iDEN/WiDEN/MOTOTalk mode for general purpose measurements of iDEN and iDEN-related signals. There are several measurements available in this mode.

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

Key Path	Mode
Example	INST:SEL IDEN
	INST:NSEL 103
Initial S/W Revision	A.02.00

Remote Language Compatibility

The Remote Language Compatibility (RLC) mode provides remote command backwards compatibility for the 8560 series of spectrum analyzers, known as legacy spectrum analyzers.

NOTE After changing into or out of this mode, allow a 1 second delay before sending any subsequent commands.

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

Key Path	Mode
Example	INST:SEL RLC
	Or
	INST:NSEL 266
Initial S/W Revision	Prior to A.02.00

SCPI Language Compatibility

The SCPI Language Compatibility mode provides remote language compatibility for SCPI-based instruments, such as the Rohde and Schwartz FSP and related series of spectrum analyzers.

NOTE After changing into or out of this mode, allow a 1 second delay before sending any subsequent commands.

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

Key Path	Mode
Example	INST:SEL SCPILC
	Or
	INST:NSEL 270
Initial S/W Revision	A.06.00

89601 VSA

Selecting the 89601 VSA mode will start the 89600-Series VSA software application. The 89600 VSA software is powerful, PC-based software, offering the industry's most sophisticated general purpose and standards specific signal evaluation and troubleshooting tools for the R&D engineer. Reach deeper into signals, gather more data on signal problems, and gain greater insight.

For more information see the Agilent 89600 Series VSA web site at www.agilent.com/find/89600

To learn more about how to use the 89600 VSA running in the X-Series, after the 89600 VSA application is running, open the 89600 VSA Help and open the "About Agilent X-Series Signal Analyzers (MXA/EXA) with 89600-Series Software" help topic.

Key Path	Mode
Example	INST:SEL VSA89601
	INST:NSEL 101
Initial S/W Revision	Prior to A.02.00

Global Settings

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

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

Global Center Freq

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

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

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

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

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

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

Key Path	Mode Setup, Global Settings
Scope	Mode Global
Remote Command	`:INSTrument:COUPle:FREQuency:CENTer ALL|NONE`
	`:INSTrument:COUPle:FREQuency:CENTer?`
Example	INST:COUP:FREQ:CENT ALL
	INST:COUP:FREQ:CENT?
Preset	Set to Off on Global Settings, Restore Defaults and System, Restore Defaults, All Modes
Range	On | Off
Initial S/W Revision	Prior to A.02.00

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

Restore Defaults

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

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

Amplitude Correction

This key selects the Amplitude Corrections as the data type to be imported. When pressed a second time, it brings up the Select Menu, which lets you select the Correction into which the data will be imported.

Amplitude Corrections are fully discussed in the documentation of the Input/Output key, under the Corrections softkey.

A set of preloaded Corrections files can be found in the directory

/My Documents/ EMC Limits and Ampcor.

Under this directory, the directory called Ampcor (Legacy Naming) contains a set of legacy corrections files, generally the same files that were supplied with older Agilent EMI analyzers, that use the legacy suffixes .ant, .oth, .usr, and .cbl, and the old 8-character file names. In the directory called Ampcor, the same files can be found, with the same suffixes, but with longer, more descriptive filenames.

When the Amplitude Correction is an Antenna correction and the Antenna Unit in the file is not None, the Y Axis Unit setting will change to match the Antenna Unit in the file.

Key Path	Front Panel Key
Mode	SA|EDGEGSM|PN
Remote Command	`:MMEMory:LOAD:CORRection 1|2|3|4|5|6, <filename>`
Example	:MMEM:LOAD:CORR 2 "myAmpcor.csv" recalls the Amplitude Correction data from the file myAmpcor.csv in the current directory to the 2nd Amplitude Correction table, and turns on Correction 2. The default path is My Documents\amplitudeCorrections.
Dependencies	Only the first correction array (Correction 1) supports antenna units. This means that a correction file with an Antenna Unit can only be loaded into the Corrections 1 register. Consequently only for Correction 1 does the dropdown in the Recall dialog include.ant, and if an attempt is made to load a correction file into any other Correction register which DOES contain an antenna unit, a Mass Storage error is generated. Corrections are not supported by all Measurements. If in a Mode in which some Measurements support it, this key will be grayed out in measurements that do not. The key will not show at all if no measurements in the Mode support it. Errors are reported if the file is empty or missing, or if the file type does not match, or if there is a mismatch between the file type and the destination data type. If any of these occur during manual operation, the analyzer returns to the Import Data menu and the File Open dialog goes away. This key does not appear unless you have the proper option installed in your instrument. This command will generate an “Option not available” error unless you have the proper

option installed in your instrument.

Couplings	When a correction file is loaded from mass storage, it is automatically turned on (Correction ON) and Apply Corrections is set to On. This allows the user to see its effect, thus confirming the load.
Readback	selected Correction
Backwards Compatibility SCPI	`:MMEMory:LOAD:CORRection ANTenna | CABLe | OTHer | USER, <filename>`
	For backwards compatibility, ANTenna maps to 1, CABle maps to 2, OTHer maps to 3 and USER maps to 4
Initial S/W Revision	A.02.00

Amplitude Correction 1, 2, 3, 4

These keys let you select which Correction to import the data into. Once selected, the key returns back to the Import Data menu and the selected Correction number is annotated on the key. The next step is to select the Open key in the Import Data menu.

Antenna corrections are a particular kind of Amplitude Corrections – they are distinguished in the corrections file by having the Antenna Unit set to a value other than None. Only Correction 1 supports Antenna Units.

Key Path	Recall, Data, Amplitude Correction
Notes	auto return
Dependencies	Only Correction 1 may be used to load a Correction that contains an Antenna Unit other than None
Preset	not part of Preset, but is reset to Correction 1 by Restore Input/Output Defaults; survives shutdown
State Saved	The current Correction number is saved in instrument state
Initial S/W Revision	A.02.00

Mode Preset

Returns the active mode to a known state.

Mode Preset does the following for the currently active mode:

Mode Preset does not:

See "How-To Preset" on page 4-148 for more information.

Key Path	Front-panel key
Remote Command	`:SYSTem:PRESet`
Example	:SYST:PRES
Notes	*RST is preferred over :SYST:PRES for remote operation. *RST does a Mode Preset, as done by the :SYST:PRES command, and it sets the measurement mode to Single measurement rather than Continuous for optimal remote control throughput. Clears all pending OPC bits. The Status Byte is set to 0.
Couplings	A Mode Preset aborts the currently running measurement, activates the default measurement, and. gets the mode to a consistent state with all of the default couplings set.
Backwards Compatibility Notes	In the X-Series, the legacy "Factory Preset" has been replaced with Mode Preset, which only presets the currently active mode, not the entire instrument. In X-Series, the way in to preset the entire instrument is by using System, Restore System Defaults All, which behaves essentially the same way as restore System Defaults does on ESA and PSA. There is also no "Preset Type" as there is on PSA. There is a Mode Preset green front-panel key that does a Mode Preset and awhite-with-green-letters User Preset front panel key that does a User Preset. The old PRESet:TYPE command is ignored (without generating an error), and SYST:PRES without a parameter does a Mode Preset, which should cover most backward code compatibility issues. The settings and correction data under the Input/Output front-panel key (examples: Input Z Corr, Ext Amp Gain, etc) are no longer part of any Mode, so they will not be preset by a Mode Preset. They are preset using Restore Input/Output Defaults, Restore System Defaults All. Note that because User Preset does a Recall State, and all of these settings are saved in State, they ARE recalled when using User Preset.
Initial S/W Revision	Prior to A.02.00

How-To Preset

The table below shows all possible presets, their corresponding SCPI commands and front-panel access (key paths). Instrument settings depend on the current measurement context. Some settings are local to the current measurement, some are global (common) across all the measurements in the current mode, and some are global to all the available modes. In a similar way, restoring the settings to their preset state can be done within the different contexts.

Auto Couple - is a measurement local key. It sets all Auto/Man parameter couplings in the measurement to Auto. Any Auto/Man selection that is local to other measurements in the mode will not be affected.

Meas Preset - is a measurement local key. Meas Preset resets all the variables local to the current measurement except the persistent ones.

Mode Preset - resets all the current mode's measurement local and measurement global variables except the persistent ones.

Restore Mode Defaults - resets ALL the Mode variables (and all the Meas global and Meas local variables), including the persistent ones.

Type Of Preset	SCPI Command	Front Panel Access
Auto Couple	:COUPle ALL	Auto Couple front-panel key
Meas Preset	:CONFigure:<Measurement>	Meas Setup Menu
Mode Preset	:SYSTem:PRESet	Mode Preset (green key)
Restore Mode Defaults	:INSTrument:DEFault	Mode Setup Menu
Restore All Mode Defaults	:SYSTem:DEFault MODes	System Menu; Restore System Default Menu
*RST	*RST	not possible (Mode Preset with Single)
Restore Input/Output Defaults	:SYSTem:DEFault INPut	System Menu; Restore System Default Menu
Restore Power On Defaults	:SYSTem:DEFault PON	System Menu; Restore System Default Menu
Restore Alignment Defaults	:SYSTem:DEFault ALIGn	System Menu; Restore System Default Menu
Restore Miscellaneous Defaults	:SYSTem:DEFault MISC	System Menu; Restore System Default Menu
Restore All System Defaults	:SYSTem:DEFault [ALL]	System Menu; Restore System Default Menu

	:SYSTem:PRESet:PERSistent	
User Preset	:SYSTem:PRESet:USER	User Preset Menu
User Preset All Modes	:SYSTem:PRESet:USER:ALL	User Preset Menu
Power On Mode Preset	:SYSTem:PON:TYPE MODE	System Menu
Power On User Preset	:SYSTem:PON:TYPE USER	System Menu
Power On Last State	:SYSTem:PON:TYPE LAST	System Menu

Mode Setup

This key allows the user to select the radio standard of the signals to be measured.

Key Path Front-panel Key

Radio Standards

Allows the user to specify the Radio Standard to be measured, the supported WLAN standards in the apps are: IEEE 802.11a, IEEE 802.11b, IEEE 802.11g, and IEEE 802.11n

Key Path	Mode Setup
Mode	Combined WLAN
Remote Command	`[:SENSe]:RADio:STANdard W11A|W11B|W11GOFDM|W11GDSSS|W11N` `[:SENSe]:RADio:STANdard?`
Example	:RADio:STAN W11A :RADio:STAN?
Preset	W11A
State Saved	Saved in instrument state.
Range	802.11a|802.11b| 802.11g-OFDM|802.11g-DSSS|802.11n

Restore Mode Defaults

Resets the state for the currently active mode by resetting the mode persistent settings to their factory default values, clearing mode data and by performing a Mode Preset. This function will never cause a mode switch. This function performs a full preset for the currently active mode; whereas, Mode Preset performs a partial preset. Restore Mode Defaults does not affect any system settings. System settings are reset by the Restore System Defaults function. This function does reset mode data; as well as settings.

Key Path	Mode Setup
Remote	`:INSTrument:DEFault`

Command

Example :INST:DEF

Notes Clears all pending OPC bits. The Status Byte is set to 0.

A message comes up saying: “If you are sure, press key again”.

Couplings A Restore Mode Defaults will cause the currently running measurement to be aborted and causes the default measurement to be active. It gets the mode to a consistent state with all of the default couplings set.

Initial S/W Revision Prior to A.02.00

Peak Search

This mode does not have Peak Search functionality.

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

Print

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

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

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

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

Quick Save

The Quick Save front-panel key repeats the most recent save that was performed from the Save menu, with the following exceptions: :

- Register saves are not remembered as Saves for the purpose of the Quick Save function

- If the current measurement does not support the last non-register save that was performed, an informational message is generated, “File type not supported for this measurement”

Quick Save repeats the last type of qualified save (that is, a save qualified by the above criteria) in the last save directory by creating a unique filename using the Auto File Naming algorithm described below.

If Quick Save is pressed after startup and before any qualified Save has been performed, the Quick Save function performs a Screen Image save using the current settings for Screen Image saves (current theme, current directory), which then becomes the “last save” for the purpose of subsequent Quick Saves.

The Auto File Naming feature automatically generates a file name for use when saving a file. The filename consists of a prefix and suffix separated by a dot, as is standard for the Windows® file system. A default prefix exists for each of the available file types:

Type	Default Prefix	Menu
State	State_	(Save/Recall)
Trace + State	State_	(Save/Recall)
Screen	Screen_	(Save/Recall)
Amplitude Corrections	Ampcor_	(Import/Export)
Traces	Trace_	(Import/Export)
Limit Lines	LLine_	(Import/Export)
Measurement Result	MeasR_	(Import/Export)
Capture Buffer	CapBuf_	(Import/Export)

A four digit number is appended to the prefix to create a unique file name. The numbering sequence starts at 0000 within each Mode for each file type and

updates incrementally to 9999, then wraps to 0000 again. It remembers where it was through a Mode Preset and when leaving and returning to the Mode. It is reset by Restore Misc Defaults and Restore System Defaults and subsequent running of the instrument application. So, for example, the first auto file name generated for State files is State_0000.state. The next is State_0001, and so forth.

One of the key features of Auto File Name is that we guarantee that the Auto File Name will never conflict with an existing file. The algorithm looks for the next available number. If it gets to 9999, then it looks for holes. If it find no holes, that is no more numbers are available, it gives an error.

For example, if when we get to State_0010.state there is already a State_ 0010.state file in the current directory, it advances the counter to State_ 0011.state to ensure that no conflict will exist (and then it verifies that State_ 0011.state also does not exist in the current directory and advances again if it does, and so forth).

If you enter a file name for a given file type, then the prefix becomes the filename you entered instead of the default prefix, followed by an underscore. The last four letters (the suffix) are the 4-digit number.

For example, if you save a measurement results file as “fred.csv”, then the next auto file name chosen for a measurement results save will be fred_0000.csv.

NOTE Although 0000 is used in the example above, the number that is used is actually the current number in the Meas Results sequence, that is, the number that would have been used if you had not entered your own file name.

.

NOTE If the filename you entered ends with _dddd, where d=any number, making it look just like an auto file name, then the next auto file name picks up where you left off with the suffix being dddd + 1.

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

Recall

Accesses a menu that enables you to select the information that you want to recall.

The options are State, Trace and Data. (screen images can be saved, but not recalled.) The default paths for Recall are data type dependent and are the same as for the Save key.

Key Path	Front-panel key
Notes	No remote command directly controls the Recall Type that this key controls. The Recall type is a node in the :MMEM:LOAD command. An example is :MMEM:LOAD:STATe <filename>. If the user tries to recall a State file for a mode that is not licensed or not available in the instrument, an error message will occur and the state will not change.
Backwards Compatibility Notes	In legacy analyzers, it was possible to load a state without affecting the trace data, limit lines or correction data. Similarly (since User Preset is actually loading a state), it was possible to do a User Preset without affecting the trace data, limit lines or correction data. In the X-Series, "state" always includes all of this data; so whenever state is loaded, all of the traces, limit lines and corrections are affected. Although this differs from previous behavior, it is desirable behavior, and should not cause adverse issues for users.
Backwards Compatibility Notes	Recall for the X-Series supports backward compatibility in the sense that you can recall a state file from any X-Series model number and any version of X-Series software. If the user tries to recall a state file onto an instrument with less capability than what was available on the instrument during the save, the recall will ignore the state it doesn't support and it will limit the recalled setting to what it allows. Example: if the saved state includes preamp ON, but the recalling instrument does not have a preamp; the preamp is limited to OFF. Conversely, if the user saves state without a preamp, the preamp is OFF in the state file. When this saved file is recalled on an instrument with a licensed preamp, the preamp is changed to OFF. Another example is if the saved state has center frequency set to 20 GHz, but the instrument recalling the saved state is a different model and only supports 13.5 GHz. In this case, the center frequency is limited along with any other frequency based settings. Since the center frequency can't be preserved in this case, the recall limiting tries to at least preserve span to keep the measurement setup as intact as possible. Note that there is no compatibility outside of X-Series; for example, you cannot recall a state file from ESA or PSA.
Initial S/W Revision	Prior to A.02.00

State

Accesses a menu that enables you to recall a State that has previously been saved. Recalling a saved state returns the analyzer as close as possible to the mode context and may cause a mode switch if the file selected is not for the current active mode. A State file can be recalled from either a register or a file. Once you select the source of the recall in the State menu, the recall will occur.

See "More Information" on page 4-157.

Key Path	Recall
Mode	All
Example	MMEM:LOAD:STAT "MyStateFile.state"
	This loads the state file data (on the default file directory path) into the instrument state.
Notes	See Open.
Initial S/W Revision	Prior to A.02.00

More Information

In measurements that support saving Traces, for example, Swept SA, the Trace data is saved along with the State in the State file. When recalling the State, the Trace data is recalled as well. Traces are recalled exactly as they were stored, including the writing mode and update and display modes. If a Trace was updating and visible when the State was saved, it will come back updating and visible,and its data will be rewritten right away. When you use State to save and recall traces, any trace whose data must be preserved should be placed in View or Blank mode before saving.

The following table describes the Trace Save and Recall possibilities:

You want to recall state and one trace's data,	Save Trace+State from 1 trace. Make sure that no other traces are updating (they should all be in	On Recall, specify the trace you want to load the one trace's data into. This trace will load in View. All other traces' data will be unaffected, although

leaving other traces unaffected.	View or Blank mode) when the save is performed.	their trace mode will be as it was when the state save was performed.
You want to recall all traces	Save Trace+State from ALL traces.	On Recall, all traces will come back in View (or Blank if they were in Blank or Background when saved)
You want all traces to load exactly as they were when saved.	Save State	On recall, all traces' mode and data will be exactly as they were when saved. Any traces that were updating willhave their data immediately overwritten.

Register 1 thru Register 6

Selecting any one of these register keys causes the State of the mode from the specified Register to be recalled. Each of the register keys annotates whether it is empty or at what date and time it was last modified.

Registers are shared by all modes, so recalling from any one of the 6 registers may cause a mode switch to the mode that was active when the save to the Register occurred.

After the recall completes, the message "Register <register number> recalled" appears in the message bar. If you are in the Spectrum Analyzer Mode, and you are recalling a register that was saved in the Spectrum Analyzer Mode, then after the recall, you will still be in the Recall Register menu. If the Recall causes you to switch modes, then after the Recall, you will be in the Frequency menu.

Key Path	Recall, State
Example	*RCL 1
Readback	Date and time with seconds resolution of the last Save is displayed on the key, or "(empty)" if no prior save operation performed to this register.
Initial S/W Revision	Prior to A.02.00

Key Path Recall, State

Example *RCL 2

Readback Date and time with seconds resolution of the last Save is displayed on the key, or "(empty)" if no prior save operation performed to this register.

Initial S/W Revision Prior to A.02.00

Key Path Recall, State

Example *RCL 3

Readback Date and time with seconds resolution of the last Save is displayed on the key, or "(empty)" if no prior save operation performed to this register.

Initial S/W Revision Prior to A.02.00

Key Path Recall, State

Example *RCL 4

Readback Date and time with seconds resolution of the last Save is displayed on the key, or "(empty)" if no prior save operation performed to this register.

Initial S/W Revision Prior to A.02.00

Key Path Recall, State

Example *RCL 5

Readback Date and time with seconds resolution of the last Save is displayed on the key, or "(empty)" if no prior save operation performed to this register.

Initial S/W Revision Prior to A.02.00

Key Path Recall, State

Example *RCL 6

Readback Date and time with seconds resolution of the last Save is displayed on the key, or "(empty)" if no prior save operation performed to this register.

Initial S/W Revision	Prior to A.02.00

From File\ File Open

Brings up the standard Windows® File Open dialog and its corresponding key menu.

When you first enter this dialog, the State File default path is in the Look In: box in this File Open dialog. The File Open dialog is loaded with the file information related to the State Save Type. The first *.state file is highlighted. The only files that are visible are the *.state files and the Files of type is *.state, since .state is the file suffix for the State save type. For more details, refer to "File Open Dialog and Menu" on page 4-160.

Key Path	Recall, State
Notes	Brings up the Open dialog for recalling a State Save Type
Initial S/W Revision	Prior to A.02.00

File Open Dialog and Menu

The File Open is a standard Windows dialog and has a File Open key menu. Each key in this menu corresponds to the selectable items in the File Open dialog box. The menu keys can be used for easy navigation between the selections within the dialog or the standard Tab and Arrow keys can be used for dialog navigation. When you navigate to this selection, you have already limited the file recall type and now you want to specify which file to open.

Initial S/W Revision	Prior to A.02.00

Open

This selection and the Enter key, when a filename has been selected or specified,cause the load to occur. Open loads the specified or selected file to the

previously selected recall type of either State or a specific import data type.

Notes	Advisory Event "File <file name> recalled" after recall is complete.
Initial S/W Revision	Prior to A.02.00

File/Folder List

This menu key navigates to the center of the dialog that contains the list of files and folders. Once hereyoucan get information about the file.

Key Path	Recall, <various>, Open...
Notes	Pressing this key navigates you to the files and folders list in the center of the dialog.
Initial S/W Revision	Prior to A.02.00

Sort

Accesses a menu that enables you to sort the files within the File Open dialog. Only one sorting type can be selected at a time and the sorting happens immediately.

Key Path	Recall, <various>, Open...
Notes	No SCPI command directly controls the sorting.
Initial S/W Revision	Prior to A.02.00

By Name

Accesses a menu that enables you to sort the list of files within the scope of the File Open dialog in ascending or descending order based on the filename.

Key Path	Recall, <various>, Open..., Sort
Notes	Files in the File Open dialog are sorted immediately in the selected order
Initial S/W Revision	Prior to A.02.00

By Extension

Accesses a menu that enables you to sort the list of files within the scope of the File Open dialog in ascending or descending order based on the file extension for each file.

Key Path	Recall, <various>, Open..., Sort
Notes	Files in the File Open dialog are sorted immediately in the selected order
Initial S/W Revision	Prior to A.02.00

By Size

Accesses a menu that enables you to sort the list of files within the scope of the File Open dialog in ascending or descending order based on file size.

Key Path	Recall, <various>, Open..., Sort
Notes	Files in File Open dialog are sorted immediately in the selected order
Initial S/W Revision	Prior to A.02.00

Ascending

This causes the display of the file list to be sorted, according to the sort criteria, in ascending order.

Key Path	Recall, <various>, Open..., Sort
Notes	Files in File Open dialog are sorted immediately in the selected order
Initial S/W Revision	Prior to A.02.00

Descending

This causes the display of the file list to be sorted, according to the sort criteria, in descending order.

Key Path	Recall, <various>, Open..., Sort
Notes	Files in File Open dialog are sorted immediately in the selected order
Initial S/W Revision	Prior to A.02.00

By Date

Accesses a menu that enables you to sort the list of files within the scope of the File Open dialog in ascending or descending data order. The date is the last data modified.

Key Path	Recall, <various>, Open..., Sort
Notes	Files in the File Open dialog are sorted immediately in the selected order
Initial S/W Revision	Prior to A.02.00

Files Of Type

This menu key corresponds to the Files Of Type selection in the dialog. It follows the standard Windows supported Files Of Type behavior. It shows the current file suffix that corresponds to the type of file the user has selected to save. Ifyou navigated here from recalling State, "State File (*.state)" is in the dialog selection and is the only type available in the pull down menu. If you navigated here from recalling Trace, "Trace+State File (*.trace)" is in the dialog selection and is the only type available under the pull down menu.

If younavigated here from importing a data file, the data types available will be dependent on the current measurement and the selection you made under Import Data. For example:

Amplitude Corrections: pull down menu shows

Limit: pull down menu shows

Trace: pull down menu shows

Key Path	Recall, <various>, Open...
Notes	Pressing this key causes the pull down menu to list all possible file types available in this context.
Initial S/W Revision	Prior to A.02.00

Up One Level

This menu key corresponds to the icon of a folder with the up arrow that is in the tool bar of the dialog. It follows the standard Windows supported Up One Level behavior. When pressed, it directs the file and folder list to navigate up one level in the directory structure.

Key Path	Recall, <various>, Open...
Notes	When pressed, the file and folder list is directed up one level of folders and the new list of files and folders is displayed.
Initial S/W Revision	Prior to A.02.00

Cancel

Cancels the current File Open request. It follows the standard Windows supported Cancel behavior.

Key Path	Recall, <various>, Open...
Notes	Pressing this key causes the Open dialog to go away and auto return.
Initial S/W Revision	Prior to A.02.00

Data (Import)

Importing a data file loads data that was previously saved from the current measurement or from other measurements and/or modes that produce the same type of data. The Import Menu only contains Data Types that are supported by the current measurement.

Since the commonly exported data files are in .csv format, the data can be edited by the user prior to importing. This allows you to export a data file, manipulate the data in Excel (the most common PC Application for manipulating .csv files) and then import it.

Importing Data loads measurement data from the specified file into the specified or default destination, depending on the data type selected. Selecting an Import Data menu key will not actually cause the importing to occur, since the analyzer still needs to know from where to get the data. Pressing the Open key in this

menu brings up the Open dialog and Open menu that provides you with the options from where to recall the data. Once a filename has been selected or entered in the Open menu, the recall occurs as soon as the Open key is pressed.

Key Path	Recall
Mode	All
Notes	The menu is built from whatever data types are available for the mode. Some keys will be missing completely, so the key locations in the sub-menu will vary. No SCPI command directly controls the Data Type that this key controls. The Data Type is included in the MMEM:LOAD commands.
Dependencies	If a file type is not used by a certain measurement, it is grayed out for that measurement. The key for a file type will not show at all if there are no measurements in the Mode that support it.
Preset	Is not affected by Preset or shutdown, but is reset during Restore Mode Defaults
Readback	The data type that is currently selected
Initial S/W Revision	Prior to A.02.00

Open...

Accesses the standard Windows File Open dialog and the File Open key menu. When you navigate to this selection, you have already determinedyou are recalling a specific Data Type and now you want to specify which file to open.

When you first enter this dialog, the path in the Look In: field depends on which import data type you selected.

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

Key Path	Recall, Data
Notes	The key location is mode-dependent and will vary. Brings up Open dialog for recalling a <mode specific> Save Type
Initial S/W Revision	Prior to A.02.00

Open

The import starts by checking for errors. Then the import can start. For all data types, the actual import starts by aborting the currently running measurement. Then the import does data type specific behavior:

Restart

The Restart function restarts the current sweep, or measurement, or set of averaged/held sweeps or measurements. If you are Paused, pressing Restart does a Resume.

The Restart function is accessed in several ways:

Key Path	Front panel key
Remote Command	`:INITiate[:IMMediate]`
	`:INITiate:RESTart`
Example	:INIT:IMM
	:INIT:REST
Notes	:INITiate:RESTart and :INITiate:IMMediate perform exactly the same function.
Couplings	Resets average/hold count k. For the first sweep overwrites all active (update=on) traces with new current data. For application modes, it resets other parameters as required by the measurement.
Status Bits/OPC dependencies	This is an Overlapped command.
	The STATus:OPERation register bits 0 through 8 are cleared.
	The STATus:QUEStionable register bit 9 (INTegrity sum) is cleared.
	The SWEEPING bit is set.
	The MEASURING bit is set.
Backwards Compatibility Notes	For Spectrum Analysis mode in ESA and PSA, the Restart hardkey and the INITiate:RESTart command restart trace averages (displayed average count reset to 1) for a trace in Clear Write, but did not restart Max Hold and Min Hold.
	In the X-Series, the Restart hardkey and the INITiate:RESTart command restart not only Trace Average, but Max Hold and Min Hold traces as well.
	For wireless comms modes in ESA and PSA, the Restart hardkey and the INITiate:RESTart command restart every measurement, which includes all traces and numeric results. There is no change to this operation.
Initial S/W Revision	Prior to A.02.00

The Restart function first aborts the current sweep/measurement as quickly as possible. It then resets the sweep and trigger systems, sets up the measurement

and initiates a new data measurement sequence with a new data acquisition (sweep) taken once the trigger condition is met.

If the analyzer is in the process of aligning when Restart is executed, the alignment finishes before the restart function is performed.

Even when set for Single operation, multiple sweeps may be taken when Restart is pressed (for example, when averaging/holding is on). Thus when we say that Restart "restarts a measurement," we may mean:

With Average/Hold Number (in Meas Setup menu) set to 1, or Averaging off, or no trace in Trace Average or Hold, a single sweep is equivalent to a single measurement. A single sweep is taken after the trigger condition is met; and the analyzer stops sweeping once that sweep has completed. However, with Average/Hold Number >1 and at least one trace set to Trace Average, Max Hold, or Min Hold (SA Measurement) or Averaging on (most other measurements), multiple sweeps/data acquisitions are taken for a single measurement. The trigger condition must be met prior to each sweep. The sweep is stopped when the average count k equals the number N set for Average/Hold Number. A measurement average usually applies to all traces, marker results, and numeric results; but sometimes it only applies to the numeric results.

Once the full set of sweeps has been taken, the analyzer will go to idle state. To take one more sweep without resetting the average count, increment the average count by 1, by pressing the step up key while Average/Hold Number is the active function, or sending the remote command CALC:AVER:TCON UP.

Save

Accesses a menu that provides the save type options. The Save Type options are State, Trace, Data, or a Screen Image depending on the active mode.

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

State

Selects State as the save type and accesses a menu that provides the options of where to save. You can save either to a register or a file. This menu key will not actually cause the save until the location is chosen.

Saving the state is the only way to save this exact measurement context for the current active mode. The entire state of the active mode is saved in a way that when a recall is requested, the mode will return to as close as possible the context in which the save occurred. This includes all settings and data for only the current active mode.

It should be noted that the Input/Output settings will be saved when saving State, since these settings plus the state of the mode best characterize the current context of the mode, but the mode independent System settings will not be saved.

For rapid saving, the State menu lists registers to save to, or you can select a file to save to. Once they select he destination of the save in the State menu, the save will occur.

Key Path	Save
Mode	All
Example	MMEM:STOR:STATe "MyStateFile.state"
	This stores the current instrument state data in the file MyStateFile.state in the default directory.
Notes	See Save.
Initial S/W Revision	Prior to A.02.00

Register 1 thru Register 6

Selecting any one of these register menu keys causes the State of the currently active mode to be saved to the specified Register. The registers are provided for rapid saving and recalling, since you do not need to specify a filename or navigate to a file. Each of the register menu keys annotates whether it is empty or at what date and time it was last modified.

These 6 registers are all that is available from the front panel for all modes in the instrument. There are not 6 registers available for each mode. From remote, 127 Registers are available. Registers are files that are visible to the user in the My Documents\System folder.

Key Path	Save, State
Mode	All
Example	*SAV 1
Readback	Date and time with seconds resolution are displayed on the key, or "(empty)" if no prior save operation performed to this register.
Initial S/W Revision	Prior to A.02.00

Key Path	Save, State
Mode	All
Example	*SAV 2
Readback	Date and time with seconds resolution are displayed on the key, or "(empty)" if no prior save operation performed to this register.
Initial S/W Revision	Prior to A.02.00

Key Path	Save, State
Mode	All
Example	*SAV 3

Readback	Date and time with seconds resolution are displayed on the key, or "(empty)" if no prior save operation performed to this register.
Initial S/W Revision	Prior to A.02.00

Key Path	Save, State
Mode	All
Example	*SAV 4
Readback	Date and time with seconds resolution are displayed on the key, or "(empty)" if no prior save operation performed to this register.
Initial S/W Revision	Prior to A.02.00

Key Path	Save, State
Mode	All
Example	*SAV 5
Readback	Date and time with seconds resolution are displayed on the key, or "(empty)" if no prior save operation performed to this register.
Initial S/W Revision	Prior to A.02.00

Key Path	Save, State
Mode	All
Example	*SAV 6
Readback	Date and time with seconds resolution are displayed on the key, or "(empty)" if no prior save operation performed to this register.
Initial S/W Revision	Prior to A.02.00

To File . . .

Accesses a menu that enables you to select the location for saving the State. This menu is similar to a standard Windows® Save As dialog.

The default path for all State Files is:

My Documents\<mode name>\state

where <mode name> is the parameter used to select the mode with the INST:SEL command (for example, SA for the Spectrum Analyzer). This path is the Save In: path in the Save As dialog for all State Files when they first enter this dialog.

Key Path	Save, State
Mode	All
Notes	Brings up Save As dialog for saving a State Save Type
Initial S/W Revision	Prior to A.02.00

Save As . . .

Accesses a standard Windows dialog with the Save As key menu. The "File Name" field in the Save As dialog is initially loaded with an automatically generated filename specific to the appropriate Save Type. The automatically generated filename is guaranteed not to conflict with any filename currently in the directory. You may replace or modify this filename using the File Name key. See the Quick Save key documentation for more on the automatic file naming algorithm.

The Save As dialog has the last path loaded in Save In: for this particular file type. User specified paths are remembered and persist through subsequent runs of the mode. These remembered paths are mode specific and are reset back to the default using Restore Mode Defaults.

Initial S/W Revision	Prior to A.02.00

Save

Performs the actual save to the specified file of the selected type. The act of saving does not affect the currently running measurement and does not require you to be in single measurement mode to request a save. It performs the save as soon as the currently running measurement is in the idle state; when the measurement completes. This ensures the State or Data that is saved includes complete data for the current settings. The save only waits for the measurement to complete when the state or data that depends on the measurement setup is being saved. The save happens immediately when exporting corrections or when saving a screen image.

If the file already exists, a dialog appears with corresponding menu keys that allowyou to replace the existing file with an OK or to Cancel the request.

While the save is being performed, the floppy icon shows up in the settings bar near the Continuous/Single icon. After the save completes, the corresponding register menu key annotation is updated with the date the time and the message "File <file name> saved" appears in the message bar.

Notes	If the file already exists, the File Exist dialog appears and allows you to replace it or not by selecting the Yes or No menu keys that appear with the dialog.Then the key causes an auto return and Save As dialog goes away. Advisory Event "File <file name> saved" after save is complete.
Initial S/W Revision	Prior to A.02.00

File/Folder List

Enables you to navigate to the center of the dialog that contains the list of files and folders. Once here you can get information about the file.

Key Path	Save, <various>, Save As...
Notes	Pressing this key enables you to navigate to the files and folders list in the center of the dialog.
Initial S/W Revision	Prior to A.02.00

File Name

Accesses the Alpha Editor. Use the knob to choose the letter to add and the Enter front-panel key to add the letter to the file name. In addition to the list of alpha characters, this editor includes a Space key and a Done key. The Done key completes the filename, removes the Alpha Editor and returns back to the File Open dialog and menu, but does not cause the save to occur. You can also use Enter to complete the file name entry and this will cause the save to occur.

Key Path	Save, <various>, Save As...
Notes	Brings up the Alpha Editor. Editor created file name is loaded in the File name field of the Save As dialog.
Initial S/W Revision	Prior to A.02.00

Save As Type

This key corresponds to the Save As Type selection in the dialog. It follows the standard Windows® supported Save As Type behavior. It shows the current file suffix that corresponds to the type of file you have selected to save. If you navigated here from saving State, "State File (*.state)" is in the dialog selection and is the only type available under the pull down menu. If you navigated here from saving Trace, "Trace+State File (*.trace)" is in the dialog selection and is the only type available under the pull down menu. If you navigated here from exporting a data file, "Data File (*.csv)" is in the dialog and is available in the pull down menu. Modes can have other data file types and they would also be listed in the pull down menu.

Key Path	Save, <various>, Save As...
Notes	Pressing this key causes the pull down menu to list all possible file types available in this context. All types available are loaded in a 1-of-N menu key for easy navigation.
Initial S/W Revision	Prior to A.02.00

Up One Level

This key corresponds to the icon of a folder with the up arrow that is in the tool bar of the dialog. It follows the standard Windows® supported Up One Level behavior. When pressed, it causes the file and folder list to navigate up one level in the directory structure.

Key Path	Save, <various>, Save As...
Notes	When pressed, the file and folder list is directed up one level of folders and the new list of files and folders is displayed
Initial S/W Revision	Prior to A.02.00

Create New Folder

This key corresponds to the icon of a folder with the "*" that is in the tool bar of the dialog. It follows the standard Windows® supported Create New Folder behavior. When pressed, a new folder is created in the current directory with the name New Folder and allows you to enter a new folder name using the Alpha Editor.

Key Path	Save, <various>, Save As...
Notes	Creates a new folder in the current folder and lets the user fill in the folder name using the Alpha Editor.
Initial S/W Revision	Prior to A.02.00

Cancel

This key corresponds to the Cancel selection in the dialog. It follows the standard Windows supported Cancel behavior. It causes the current Save As request to be cancelled.

Key Path	Save, <various>, Save As...
Notes	Pressing this key causes the Save As dialog to go away and auto return.
Initial S/W Revision	Prior to A.02.00

Mass Storage Catalog (Remote Command Only)

Remote Command `:MMEMory:CATalog? [<directory_name>]`

Notes
The string must be a valid logical path.

Query disk usage information (drive capacity, free space available) and obtain a list of files and directories in a specified directory in the following format:

<numeric_value>,<numeric_value>,{<file_entry>}

It shall return two numeric parameters and as many strings as there are files and directories. The first parameter shall indicate the total amount of storage currently used in bytes. The second parameter shall indicate the total amount of storage available, also in bytes. The <file_entry> is a string. Each <file_entry> shall indicate the name, type, and size of one file in the directory list:

<file_name>,<file_type>,<file_size>

As windows file system has an extension that indicates file type, <file_type> is always empty. <file_size> provides the size of the file in bytes. In case of directories, <file_entry> is surrounded by square brackets and both <file_type> and <file_size> are empty.

Initial S/W Revision
Prior to A.02.00

Mass Storage Change Directory (Remote Command Only)

Remote Command `:MMEMory:CDIRectory [<directory_name>]`
`:MMEMory:CDIRectory?`

Notes
The string must be a valid logical path.

Changes the default directory for a mass memory file system. The <directory_name> parameter is a string. If no parameter is specified, the directory is set to the *RST value.

At *RST, this value is set to the default user data storage area, that is defined as System.Environment.SpecialFolder.Personal.

Query returns full path of the default directory.

Initial S/W Revision
Prior to A.02.00

Mass Storage Copy (Remote Command Only)

Remote Command `:MMEMory:COPY <string>,<string>[,<string>,<string>]`

Notes
The string must be a valid logical path.

Copies an existing file to a new file or an existing directory to a new directory.

Two forms of parameters are allowed. The first form has two parameters. In this form, the first parameter specifies the source, and the second parameter specifies the destination.

The second form has four parameters. In this form, the first and third parameters specify the source. The second and fourth parameters specify the directories. The first pair of parameters specifies the source. The second pair specifies the destination. An error is generated if the source doesn't exist or the destination file already exists.

Mass Storage Delete (Remote Command Only)

Remote Command `:MMEMory:DELete <file_name>[,<directory_name>]`

Notes
The string must be a valid logical path.

Removes a file from the specified directory. The <file_name> parameter specifies the file name to be removed.

Initial S/W Revision
Prior to A.02.00

Mass Storage Data (Remote Command Only)

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

Remote Command `:MMEMory:DATA <file_name>, <data>`
`:MMEMory:DATA? <file_name>`

Notes
The string must be a valid logical path.

The command form is MMEMory:DATA <file_name>,<data>. It loads <data> into the file <file_name>. <data> is in 488.2 block format. <file_name> is string data.

The query form is MMEMory:DATA? <file_name> with the response being the associated <data> in block format.

Initial S/W Revision
Prior to A.02.00

Mass Storage Make Directory (Remote Command Only)

Remote Command	`:MMEMory:MDIRectory <directory_name>`
Notes	The string must be a valid logical path. Creates a new directory. The <directory_name> parameter specifies the name to be created.
Initial S/W Revision	Prior to A.02.00

Mass Storage Move (Remote Command Only)

Remote Command	`:MMEMory:MOVE <string>,<string>[,<string>,<string>]`
Notes	The string must be a valid logical path. Moves an existing file to a new file or an existing directory to a new directory. Two forms of parameters are allowed. The first form has two parameters. In this form, the first parameter specifies the source, and the second parameter specifies the destination. The second form has four parameters. In this form, the first and third parameters specify the source. The second and fourth parameters specify the directories. The first pair of parameters specifies the source. The second pair specifies the destination. An error is generated if the source doesn't exist or the destination file already exists.
Initial S/W Revision	Prior to A.02.00

Mass Storage Remove Directory (Remote Command Only)

Remote Command	`:MEMMory:RDIRectory <directory_name>`
Notes	The string must be a valid logical path. Removes a directory. The <directory_name> parameter specifies the directory name to be removed. All files and directories under the specified directory shall also be removed.
Initial S/W Revision	Prior to A.02.00

Data (Export)

Exporting a data file stores data from the current measurement to mass storage files. The Export Menu only contains data types that are supported by the current measurement.

Since the commonly exported data files are in .csv format, the data can be edited by you prior to importing. This allows youto export a data file, manipulate the data in Excel (the most common PC Application for manipulating .csv files) and then import it.

Selecting an Export Data menu key will not actually cause the exporting to occur, since the analyzer still needs to know where you wish to save the data. Pressing the Save As key in this menu brings up the Save As dialog and Save As menu that allows you to specify the destination file and directory. Once a filename has been selected or entered in the Open menu, the export will occur as soon as the Save key is pressed.

Key Path	Save
Mode	All
Notes	The menu is built from whatever data types are available for the mode. So the key locations in the sub menu will vary. No SCPI command directly controls the Data Type that this key controls. The Data Type is included in the MMEM:STORe commands.
Dependencies	If a file type is not used by a certain measurement, that type is grayed out for that measurement. The key for a file type will not show at all if there are no measurements in the Mode that support it.
Preset	Is not affected by a Preset or shutdown, but is reset during Restore Mode Defaults
Readback	The data type that is currently selected
Initial S/W Revision	Prior to A.02.00

Measurement Results

Pressing this key selects Meas Results as the data type to be exported. Pressing the key a second time brings up the Meas Results menu, which allows you to

select which Meas Result to save. In the Swept SA measurement, there are three types of Measurement Results files: Peak Table, Marker Table and Spectrogram.

See "Meas Results File Contents" on page 4-180.

See "Marker Table" on page 4-181.

See "Peak Table" on page 4-186.

See Spectrogram

Remote Command	`:MMEMory:STORe:RESults:MTABle|PTABle|SPECtrogram <filename>`
Example	:MMEM:STOR:RES:MTAB “myResults.csv” saves the results from the current marker table to the file myResults.csv in the current path. :MMEM:STOR:RES:PTAB “myResults.csv” saves the results from the current peak table to the file myResults.csv in the current path. :MMEM:STOR:RES:SPEC “myResults.csv” saves the results from the current Spectrogram display to the file myResults.csv in the current path. The default path is My Documents\SA\data\SAN\results
Notes	If the save is initiated via SCPI, and the file already exists, the file will be overwritten. Using the C: drive is strongly discouraged, since it runs the risk of being overwritten during an instrument software upgrade. Both single and double quotes are supported for any filename parameter over SCPI.
Dependencies	If a save of Marker Table results is requested and the Marker Table is not on, no file is saved and a message is generated If a save of Peak Table results is requested and the Peak Table is not on, no file is saved and a message is generated If a save of Spectrogram results is requested and the Spectrogram is not on, no file is saved and a message is generated. The Spectrogram choice only appears if option EDP is licensed.
Preset	Not part of Preset, but is reset to Peak Table by Restore Mode Defaults. Survives a shutdown.
Initial S/W Revision	Prior to A.02.00

Meas Results File Contents

All files are .csv files. The following section details the data in each file type.

Marker Table

This section discusses the Marker Table Meas Results file format.

Imagine that, at the point where a Marker Table Meas Result is requested, the following screen is showing:

Then the Meas Results file, when opened, would show the following data:

MeasurementResult	
Swept SA	
A.01.40_R0017	N9020A
526 B25 PFR P26 EA3	1
Result Type	Marker Table
Ref Level	0
Number of Points	1001
Sweep Time	0.066266667
Start Frequency	10000000
Stop Frequency	26500000000
Average Count	0
Average Type	LogPower(Video)
RBW	3000000
RBW Filter	Gaussian
RBW Filter BW	3dB
VBW	3000000
Sweep Type	Swept
X Axis Scale	Lin
PreAmp State	Off
PreAmp Band	Low
Trigger Source	Free
Trigger Level	1.2
Trigger Slope	Positive
Trigger Delay	1.00E–06
Phase Noise Optimization	Fast
Swept If Gain	Low

FFT If Gain	Autorange
RF Coupling	AC
FFT Width	411900
Ext Ref	10000000
Input	RF
RF Calibrator	Off
Attenuation	10
Ref Level Offset	0
External Gain	0
X Axis Units	Hz
Y Axis Units	dBm

DATA

MKR	MODE	TRC	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE	FUNCTION UNIT
1	Normal	1	Frequency	2.2350E+09	–67.481	Off	0.0000E+00	0	None
2	Delta3	1	Frequency	0.0000E+00	–0.761	Off	0.0000E+00	0	None
3	Fixed	1	Frequency	1.3255E+10	–64.71	Off	0.0000E+00	0	None
4	Normal	2	Frequency	1.5904E+10	–73.108	Off	0.0000E+00	0	None
5	Delta7	2	Frequency	–2.7280E+09	–30.258	Band Power	1.3250E+06	–3.969	dB
6	Normal	2	Time	5.2620E–02	–70.177	Band Power	2.3840E+06	–43.15	dBm
7	Normal	3	Period	1.0680E–10	–75.458	Off	0.0000E+00	0	None
8	Normal	3	Frequency	6.7120E+09	–77.33	Noise	3.3910E+06	–139.714	dBm/Hz
9	Fixed	3	Inverse Time	4.0000E+01	–30.05	Off	0.0000E+00	0	None
10	Normal	3	Frequency	1.1454E+10	–75.161	Band Density	1.3250E+06	–138.973	dBm/Hz
11	Off	1	Frequency	0.0000E+00	0	Off	0.0000E+00	0	None
12	Off	1	Frequency	0.0000E+00	0	Off	0.0000E+00	0	None

Which, in csv form, looks like this:

MeasurementResult

Swept SA

A.01.40_R0017,N9020A

526 B25 PFR P26 EA3 ,1

Result Type,Marker Table

Ref Level,0

Number of Points,1001

Sweep Time,0.066266667

Start Frequency,10000000

Stop Frequency,26500000000

Average Count,0

Average Type,LogPower(Video)

RBW,3000000

RBW Filter,Gaussian

RBW Filter BW,3dB

VBW,3000000

Sweep Type,Swept

X Axis Scale,Lin

PreAmp State,Off

PreAmp Band,Low

Trigger Source,Free

Trigger Level,1.2

Trigger Slope,Positive

Trigger Delay,1.00E–06

Phase Noise Optimization,Fast

Swept If Gain,Low

FFT If Gain,Autorange

RF Coupling,AC

FFT Width,411900

Ext Ref,10000000

Input,RF

RF Calibrator,Off

Attenuation,10

Ref Level Offset,0

External Gain,0

X Axis Units,Hz

Y Axis Units,dBm

DATA

MKR,MODE,TRC,SCL,X,Y,FUNCTION,FUNCTION WIDTH,FUNCTION VALUE,FUNCTION UNIT

1,Normal,1,Frequency,2.235E+09,–67.481,Off,0E+00,0,None

2,Delta3,1,Frequency,0E+00,–0.761,Off,0E+00,0,None

3,Fixed,1,Frequency,13.255E+09,–64.71,Off,0E+00,0,None

4,Normal,2,Frequency,15.904E+09,–73.108,Off,0E+00,0,None

5,Delta7,2,Frequency,–2.728E+09,–30.258,Band Power,1.325E+06,–3.969,dB

6,Normal,2,Time,52.62E–03,–70.177,Band Power,2.384E+06,–43.150,dBm

7,Normal,3,Period,106.8E–12,–75.458,Off,0E+00,0,None

8,Normal,3,Frequency,6.712E+09,–77.330,Noise,3.391E+06,–139.714,dBm/Hz

9,Fixed,3,Inverse Time,40E+00,–30.05,Off,0E+00,0,None

10,Normal,3,Frequency,11.454E+09,–75.161,Band Density,1.325E+06,–138.973,dBm/Hz

11,Off,1,Frequency,0E+00,0,Off,0E+00,0,None

12,Off,1,Frequency,0E+00,0,Off,0E+00,0,None

The numbers appear in the file exactly as they appear onscreen. If it says 11.454 GHz onscreen, then in the file it is 11.454E+09.

The metadata header is very similar to the metadata used in the trace data .csv files. See Trace File Contents. The only new information concerns the 1-of-N fields in the marker table itself.

The metadata contains (line by line):

- File ID string, which is “MeasurementResult”
- Measurment ID, which is “Swept SA”
- Firwmare rev and model number
- Option string
- Result type (Marker Table, in this case)
- Ref Level
- Number of Points
- Start Frequency
- Stop Frequency
- Average Count (actual; not the limit for the instrument)
- Average Type
- RBW
- RBW Filter Type
- RBW Filter BW Type
- VBW
- Sweep Type (FFT vs. Swept)
- Log/Lin X Scale (sometimes called Log Sweep)
- Preamp (on/off, band)
- Trigger (source, level, slope, delay)

- Phase Noise optimization setting
- Swept IF Gain
- FFT IF Gain
- AC/DC setting (RF Coupling)
- FFT Width
- External Reference setting
- Input (which input is in use)
- RF Calibrator state
- Attenuation
- Ref Level Offset
- External Gain
- X Axis Unit
- Y Axis Unit

The choices for the various 1 of N and binary fields are given in section 18.3.2 of the SA PD for the trace data files.

The FUNCTION UNIT field requires some explanation. This field specifies the unit being used for each marker function. Delta marker functions, in particular, can result in complicated units, so it is of value to the user to include them in this file. In general, they should appear in this column exactly as they appear onscreen; however, when the symbol for square root appears, it should appear in the file as “root-”; for example, √Hz would appear as “root-Hz”

Peak Table

This section discusses the Peak Table Meas Results file format.

Imagine that, at the point where a Marker Table Meas Result is requested, the following screen is showing:

Then the Meas Results file, when opened, would show the header data (the same as for the Marker Table except that the Result Type is Peak Table) ending with a few fields of specific interest to Peak Table users:

These fields are then followed by the data for the Peak Table itself.

Note that the label for the Frequency column changes to Time in 0 span.

Here is what the table for the above display looks like:

MeasurementResult	
Swept SA	
A.01.40_R0017	N9020A
526 B25 PFR P26 EA3	1
Result Type	Peak Table
Ref Level	0
Number of Points	1001
Sweep Time	0.066266667
Start Frequency	10000000
Stop Frequency	26500000000
Average Count	0
Average Type	LogPower(Video)
RBW	3000000
RBW Filter	Gaussian
RBW Filter BW	3dB
VBW	3000000
Sweep Type	Swept
X Axis Scale	Lin
PreAmp State	Off
PreAmp Band	Low
Trigger Source	Free
Trigger Level	1.2
Trigger Slope	Positive
Trigger Delay	1.00E–06
Phase Noise Optimization	Fast
Swept If Gain	Low
FFT If Gain	Autorange
RF Coupling	AC
FFT Width	411900
Ext Ref	10000000

Input	RF
RF Calibrator	Off
Attenuation	10
Ref Level Offset	0
External Gain	0
X Axis Units	Hz
Y Axis Units	dBm
Peak Threshold	–85
Peak Threshold State	On
Peak Excursion	6
Peak Excursion State	On
Display Line	–61
Peak Readout	AboveDL
Peak Sort	Amptd

DATA

Peak	Frequency	Amplitude
1	1.0000E+06	1.86
2	1.0020E+06	–57.27
3	1.0048E+06	–58.97
4	9.8320E+05	–58.99
5	9.5120E+05	–59.58
6	9.9360E+05	–59.71
7	1.0390E+06	–59.71
8	1.0054E+06	–59.78
9	1.1086E+06	–60.05
10	9.9740E+05	–60.25
11	9.6680E+05	–60.25
12	1.0286E+06	–60.69
13	9.5500E+05	–60.74
14	9.5240E+05	–60.88
15	9.5140E+05	–60.89
16	9.5920E+05	–60.90
17		
18		
19		
20		

Spectrogram

This section discusses the Spectrogram Results file format. The Spectrogram choice only appears if option EDP is licensed.

The Spectrogram results are the same as a Trace data export, except that instead of having just one trace's data, all 300 traces appear one after the other.

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Each trace has its own data mark; the data for Spectrogram Trace 0 follows the row marked DATA, the data for Spectrogram Trace 1 follows the row marked DATA1, for Spectrogram Trace 2 follows the row marked DATA2, and so on.

Traces that have not yet been filled in the Spectrogram display are empty; there is no DATA header for them. The file ends after the last non-empty trace.

Imagine that, at the point where a Spectrogram Meas Result is requested, the following screen is showing:

For the purpose of this example, we have set Sweep Points to 10, and the Average/Hold Number to 10 as well. Thus we have ten traces, each with ten points.

Then the Meas Results file, when opened, would show the header data and ten traces of trace data. Here is what the table for the above display looks like:

Result Type	Spectrogram
MeasResult	
Swept SA	
A.07.00_R0002	N9020A
K03 LFE EXM EMC SEC BBA DRD P13 EP1 ALB P08 ESP BAB EDP 503 ESC B2X FSA 513 SM1 YAV EA3 508 ALL S40 B1C ERC P26 HBA MPB B25 PFR B40 SB1 ALV UK6 RTL 526 B1X P03	1
Segment	0
Number of Points	10
Sweep Time	0.066225
Start Frequency	10000000
Stop Frequency	26500000000
Average Count	0

Average Type	LogPower(Video)
RBW	3000000
RBW Filter	Gaussian
RBW Filter BW	3dB
VBW	3000000
Sweep Type	Swept
X Axis Scale	Lin
PreAmp State	Off
PreAmp Band	Low
Trigger Source	Free
Trigger Level	1.2
Trigger Slope	Positive
Trigger Delay	0
Phase Noise Optimization	Fast
Swept If Gain	Low
FFT If Gain	Autorange
RF Coupling	AC
FFT Width	411900
Ext Ref	10000000
Input	RF
RF Calibrator	Off
Attenuation	10
Ref Level Offset	0
External Gain	0
Trace Type	Clearwrite
Detector	Normal
Trace Math	Off
Trace Math Oper1	Trace5
Trace Math Oper2	Trace6
Trace Math Offset	0
Trace Name	Trace1
X Axis Units	Hz
Y Axis Units	dBm
DATA	

10000000	–10.59942865
2953333333	–109.6942668
5896666667	–63.74978347
8840000000	–135.9069121
11783333333	–63.83563906
14726666667	–107.226105
17670000000	–60.66637253
20613333333	–109.7924465
23556666667	–55.96328524
26500000000	–107.7931599
DATA1	
10000000	–10.59942865
2953333333	–109.6942668
5896666667	–63.74978347
8840000000	–135.9069121
11783333333	–63.83563906
14726666667	–107.226105
17670000000	–60.66637253
20613333333	–109.7924465
23556666667	–55.96328524
26500000000	–107.7931599
DATA2	
10000000	–10.59942865
2953333333	–109.780738
5896666667	–63.34411738
8840000000	–114.7107182
11783333333	–64.15693126
14726666667	–134.1352495
17670000000	–61.10250512
20613333333	–104.1067666
23556666667	–54.57981649
26500000000	–127.1216908
DATA3	
10000000	–10.60163346

2953333333	–105.5021907
5896666667	–63.35060799
8840000000	–137.9020412
11783333333	–63.75501735
14726666667	–135.5311642
17670000000	–60.45129841
20613333333	–106.731922
23556666667	–54.82592417
26500000000	–103.365777
DATA4	
10000000	–10.59281423
2953333333	–132.3383149
5896666667	–63.7373084
8840000000	–113.9227971
11783333333	–63.20287794
14726666667	–134.276011
17670000000	–60.67182585
20613333333	–111.114888
23556666667	–55.72558647
26500000000	–105.8742406
DATA5	
10000000	–10.60824789
2953333333	–136.4857899
5896666667	–63.42500108
8840000000	–111.9089251
11783333333	–63.84756254
14726666667	–113.0589808
17670000000	–60.90050427
20613333333	–110.8739835
23556666667	–54.69736957
26500000000	–124.6635022
DATA6	
10000000	–10.58399499
2953333333	–114.3579264

5896666667	–62.65262409
8840000000	–112.6454774
11783333333	–63.71041407
14726666667	–109.0860533
17670000000	–60.28964667
20613333333	–114.0147572
23556666667	–56.04674736
26500000000	–125.325901
DATA7	
10000000	–10.57958537
2953333333	–113.199667
5896666667	–64.26882017
8840000000	–133.0926833
11783333333	–62.27979768
14726666667	–111.4336448
17670000000	–60.01698523
20613333333	–132.5960005
23556666667	–55.10252052
26500000000	–131.5517367
DATA8	
10000000	–10.58399499
2953333333	–113.6230844
5896666667	–63.49927095
8840000000	–113.6439041
11783333333	–63.26615486
14726666667	–114.2019455
17670000000	–60.88018247
20613333333	–108.3955877
23556666667	–54.3583201
26500000000	–99.52107008
DATA9	
10000000	–10.58399499
2953333333	–109.9710904
5896666667	–62.97334418

8840000000	–115.7603538
11783333333	–63.35750673
14726666667	–115.2105976
17670000000	–60.33406203
20613333333	–131.278846
23556666667	–54.98109578
26500000000	–106.0317838
DATA10	
10000000	–10.58472992
2953333333	–134.8632983
5896666667	–63.58159132
8840000000	–113.6960127
11783333333	–63.27944439
14726666667	–108.4629902
17670000000	–59.64024466
20613333333	–132.4812054
23556666667	–55.58227385
26500000000	–102.9842389

Save As . . .

This menu lets you select the location where you can save Data Type files. It is a standard Windows® dialog with Save As menu keys. The "File Name" field in the Save As dialog is initially loaded with an automatically generated filename specific to the appropriate Save Type. The automatically generated filename is guaranteed not to conflict with any filename currently in the directory. You may replace or modify this filename using the File Name key. See the Quick Save key documentation for more on the automatic file naming algorithm.

When you first enter this dialog, the path in the Save In: field depends on the data type. The only files that are visible are the files with the corresponding data type suffix, and the Save As type lists the same suffix.

For example, if the Data Type is Amplitude Corrections, the file suffix is .csv and the *.csv files are the only visible files in the Save As dialog and .csv is the Save As Type.

The default path for saving files is:

For all of the Trace Data Files:

My Documents\<mode name>\data\traces

For all of the Limit Data Files:

My Documents\<mode name>\data\limits

For all of the Measurement Results Data Files:

My Documents\<mode name>\data\<measurement name>\results

For all of the Capture Buffer Data Files:

My Documents\<mode name>\data\captureBuffer

Key Path	Save, Data
Mode	All
Notes	The key location is mode-dependent and will vary.
	Brings up the Save As dialog for saving a <mode specific> Save Type
Initial S/W Revision	Prior to A.02.00

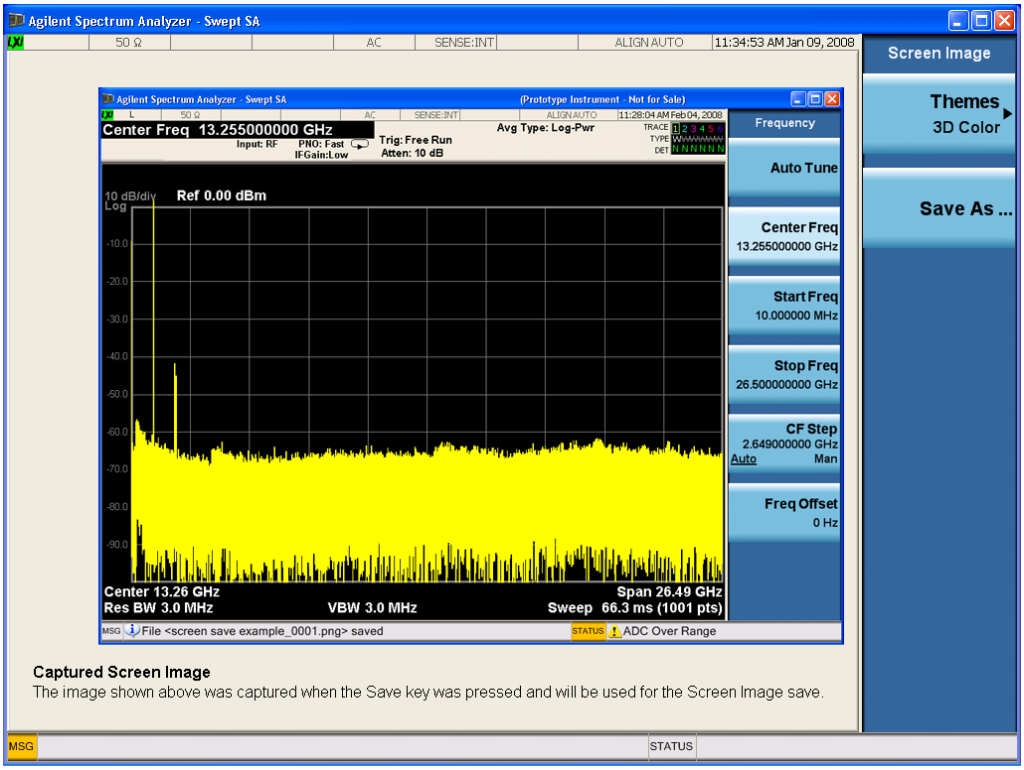
Screen Image

Accesses a menu of functions that enable you to specify a format and location for the saved screen image.

Pressing Screen Image brings up a menu that allows you to specify the color scheme of the Screen Image (Themes) or navigate to the Save As dialog to perform the actual save.

Screen Image files contain an exact representation of the analyzer display. They cannot be loaded back onto the analyzer, but they can be loaded into your PC for use in many popular applications.

The image to be saved is actually captured when the Save front panel key is pressed, and kept in temporary storage to be used if you ask for a Screen Image save. When the Screen Image key is pressed, a "thumbnail" of the captured image is displayed, as shown below:



When you continue on into the Save As menu and complete the Screen Image save, the image depicted in the thumbnail is the one that gets saved, showing the menus that were on the screen before going into the Save menus.

After you have completed the save, the Quick Save front-panel key lets you quickly repeat the last save performed, using an auto-named file, with the current screen data.

NOTE For versions previous to A.01.55, if you initiate a screen image save by navigating through the Save menus, the image that is saved will contain the Save menu softkeys, not the menus and the active function that were on the screen when you first pressed the Save front panel key.

Key Path	Save
Mode	All
Example	MMEM:STOR:SCR "MyScreenFile.png"

	This stores the current screen image in the file MyScreenFile.png in the default directory.
Notes	See
Initial S/W Revision	Prior to A.02.00

Themes

Accesses a menu of functions that enable you to choose the theme to be used when saving the screen image.

The Themes option is the same as the Themes option under the Display and Page Setup dialogs. It allows you to choose between themes to be used when saving the screen image.

Key Path	Save, Screen Image
Remote Command	`:MMEMory:STORe:SCReen:THEMe TDColor | TDMonochrome | FCOLor | FMONochrome` `:MMEMory:STORe:SCReen:THEMe?`
Example	:MMEM:STOR:SCR:THEM TDM
Preset	3D Color; Is not part of Preset, but is reset by Restore Misc Defaults or Restore System Defaults All and survives subsequent running of the modes.
Readback	3D Color | 3D Mono | Flat Color | Flat Mono
Backwards Compatibility Notes	In ESA and PSA we offer the choice of "Reverse Bitmap" or "Reverse Metafile" when saving screen images. This is much like the "Flat Color" theme available in X-Series. Also, if the user selected Reverse Bitmap AND a black&white screen image, that would be much like "Flat Monochrome". In other words, each of the X-Series themes has a similar screen image type in ESA/PSA. But they are not identical.
Initial S/W Revision	Prior to A.02.00

3D Color

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

Key Path	Save, Screen Image, Themes
Example	MMEM:STOR:SCR:THEM TDC
Readback	3D Color
Initial S/W Revision	Prior to A.02.00

Flat Color

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

Key Path	Save, Screen Image, Themes
Example	MMEM:STOR:SCR:THEM FCOL
Readback	Flat Color
Initial S/W Revision	Prior to A.02.00

3D Monochrome

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

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

Flat Monochrome

Selects a format that is like Flat Color. But only black is used (no colors, not even gray), and no fill.

Key Path	Save, Screen Image, Themes
Example	MMEM:STOR:SCR:THEM FMON
Readback	Flat Mono
Initial S/W Revision	Prior to A.02.00

Save As...

Accesses a menu that enables you to select the location where you can save the Screen Image. This menu is a standard Windows® dialog with Save As menu keys. The Save As dialog is loaded with the file information related to the Screen Image Type. The filename is filled in using the auto file naming algorithm for the Screen Image Type and is highlighted. The only files that are visible are the *.png files and the Save As Type is *.png, since .png is the file suffix for the Screen Image Type.

The default path for Screen Images is

My Documents\<mode name>\screen.

where <mode name> is the parameter used to select the mode with the INST:SEL command (for example, SA for the Spectrum Analyzer).

This path is the Save In: path in the Save As dialog for all Screen Files when you first enter this dialog.

Key Path	Save, Screen Image
Notes	Brings up Save As dialog for saving a Screen Image Save Type
Initial S/W Revision	Prior to A.02.00

Single (Single Measurement/Sweep)

Sets the analyzer for Single measurement operation. The single/continuous state is Meas Global, so the setting will affect all the measurements. If you are Paused, pressing Single does a Resume.

Key Path	Front panel key
Example	:INIT:CONT OFF
Notes	See Cont key description.
Backwards Compatibility Notes	For Spectrum Analysis mode in ESA and PSA, the Single hardkey and the INITiate:IMM switched from continuous measurement to single measurement and restarted sweeps and averages (displayed average count reset to 1), but did not restart Max Hold and Min Hold. In the X-Series, the Single hardkey and the INITiate:IMM command command initiate a sweep/ measurement/ average sequence/hold sequence including Max Hold and Min Hold. For Spectrum Analysis mode in ESA and PSA, the Single hardkey restarted the sweep regardless of whether or not you were in an active sweep or sweep sequence. In the X-Series, Restart does this but Single only restarts the sweep or sweep sequence if you are in the idle state. INIT[:IMM] in ESA & PSA Spectrum Analysis Mode does an implied ABORt. In some other PSA Modes, INIT[:IMM] is ignored if not in the idle state. . The X-Series follows the ESA/PSA SA Mode model, which may cause some Modes to have compatibility problems.
Initial S/W Revision	Prior to A.02.00

Sweep/Control

This mode does not have Sweep/Control functionality.

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

System

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

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

Show

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

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

Errors

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

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

History brings up a screen displaying the event log in chronological order, with the newest event at the top. The history queue can hold up to 100 messages (if a

message has a repeat count greater than 1 it only counts once against this number of 100). Note that this count bears no relation to the size of the SCPI queue. If the queue extends onto a second page, a scroll bar appears to allow scrolling with a mouse. Time is displayed to the second.

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

The fields on the Errors display are:

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

ID - Displays the error number.

Message - Displays the message text.

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

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

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

Key Path	System, Show
Mode	All
Remote Command	`:SYSTem:ERRor[:NEXT]?`
Example	:SYST:ERR?
Notes	The return string has the format: "<Error Number>,<Error>" Where <Error Number> and <Error> are those shown on the Show Errors screen
Backwards Compatibility Notes	In some legacy analyzers, the Repeat field shows the number of times the message has repeated since the last time the error queue was cleared. In X-Series, the Repeat field shows the number of times the error has repeated since the last intervening error. So the count may very well be different than in the past even for identical signal conditions

Unlike previous analyzers, in the X-Series all errors are reported through the Message or Status lines and are logged to the event queue. They never appear as text in the graticule area (as they sometimes do in previous analyzers) and they are never displayed in the settings panel at the top of the screen (as they sometimes do, by changing color, in previous analyzers).

As a consequence of the above, the user can only see one status condition (the most recently generated) without looking at the queue. In the past, at least in the Spectrum Analyzer, multiple status conditions might display on the right side of the graticule.

In general there is no backwards compatibility specified or guaranteed between the error numbers in X-Series and those of earlier products. Error, event, and status processing code in customers' software will probably need to be rewritten to work with X-Series.

In the legacy analyzers, some conditions report as errors and others simply turn on status bits. Conditions that report as errors often report over and over as long as the condition exists. In X-series, all conditions report as start and stop events. Consequently, software that repeatedly queries for a condition error until it stops reporting will have to be rewritten for X-series.

Initial S/W Revision	Prior to A.02.00

Previous Page

See .

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

Next Page

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

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

Status

See

History

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

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

Verbose SCPI On/Off

This is a capability that will allow the SCPI data stream to be displayed when a SCPI error is detected, showing the characters which stimulated the error and several of the characters preceding the error.

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

Refresh

When pressed, refreshes the Show Errors display.

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

Clear Error Queue

This clears all errors in all error queues.

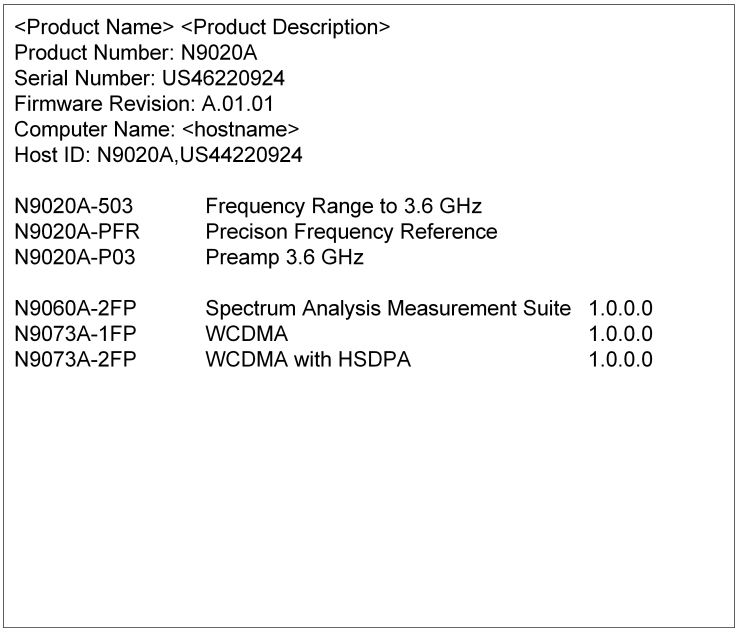
Note the following:

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

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

System

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



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

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

Show System contents (Remote Command Only)

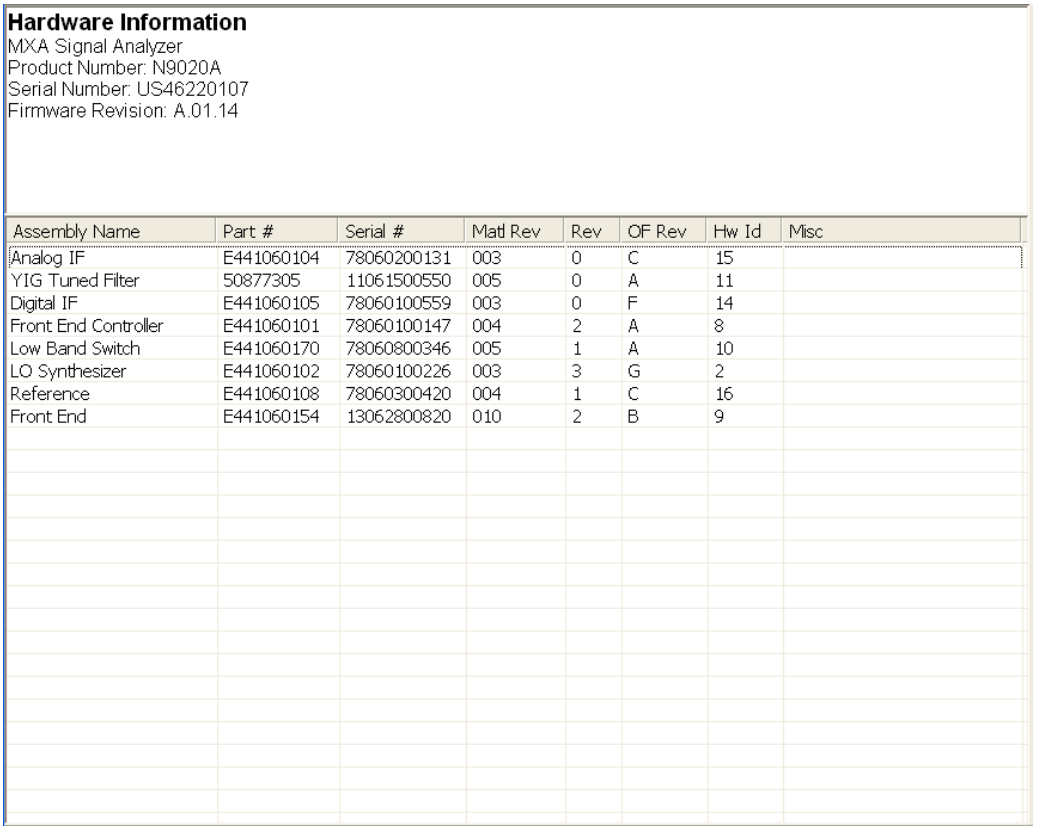
A remote command is available to obtain the contents of the Show System screen (the entire contents, not just the currently displayed page).

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

Hardware

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

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



Hardware Information
MXA Signal Analyzer
Product Number: N9020A
Serial Number: US46220107
Firmware Revision: A.01.14

Assembly Name	Part #	Serial #	Matl Rev	Rev	OF Rev	Hw Id	Misc
Analog IF	E441060104	78060200131	003	0	C	15	
YIG Tuned Filter	50877305	11061500550	005	0	A	11	
Digital IF	E441060105	78060100559	003	0	F	14	
Front End Controller	E441060101	78060100147	004	2	A	8	
Low Band Switch	E441060170	78060800346	005	1	A	10	
LO Synthesizer	E441060102	78060100226	003	3	G	2	
Reference	E441060108	78060300420	004	1	C	16	
Front End	E441060154	13062800820	010	2	B	9	

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

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

LXI

This key shows you the product number, serial number, firmware revision, computer name, IP address, Host ID, LXI Class, LXI Version, MAC Address, and the Auto-MDIX Capability.

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

LXI Event Log

The event log records all of the LXI LAN event activity. As LXI LAN events are sent or received, the activity is noted in the Event Log with an IEEE 1588 timestamp. When the event log is selected, the current contents of the event log are displayed in the system information screen.

The fields recorded in the Event Log are:

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

Circular

Sets the behavior for entries that occur while the LXI Event Log is full.

Key Path	System, Show, LXI, LXI Event Log
Remote Command	`:LXI:EVENt:LOG:CIRCular[:ENABle] ON|OFF|1|0` `:LXI:EVENt:LOG:CIRCular[:ENABle]?`
Example	:LXI:EVEN:LOG:CIRC 1
Preset	ON
Preset	Not affected by a Preset. The default value of "ON" can be restored by pressing System, Restore Defaults, Misc.
State Saved	Saved in instrument state.
Range	OFF|ON|0|1
Initial S/W Revision	Prior to A.02.00

Clear

Clears the event log of all entries.

Key Path	System, Show, LXI, LXI Event Log
Remote Command	`:LXI:EVENt:LOG:CLEar`
Example	:LXI:EVEN:LOG:CLE
Initial S/W Revision	Prior to A.02.00

Size

Sets the maximum number of entries the LXI Event Log can hold.

Key Path	System, Show, LXI, LXI Event Log
Remote Command	`:LXI:EVENt:LOG:SIZE <size>` `:LXI:EVENt:LOG:SIZE?`
Example	:LXI:EVEN:LOG:SIZE 256
Preset	64
Preset	Not affected by a Preset. The default value of "64" can be restored by pressing System, Restore Defaults, Misc.
State Saved	Saved in instrument state.
Range	>= 0
Initial S/W Revision	Prior to A.02.00

Enabled

Enables and disables the logging of LXI Events.

Key Path	System, Show, LXI, LXI Event Log
Remote Command	`:LXI:EVENt:LOG:ENABle ON|OFF|1|0` `:LXI:EVENt:LOG:ENABle?`
Example	:LXI:EVEN:LOG:ENAB ON
Preset	ON
Preset	Not affected by a Preset. The default value of "ON" can be restored by pressing System, Restore Defaults, Misc.
State Saved	Saved in instrument state.
Range	ON|OFF|0|1
Initial S/W Revision	Prior to A.02.00

Count (Remote Command Only)

Returns the number of entries currently in the LXI Event Log.

Remote Command	`:LXI:EVENt:LOG:COUNt?`
Example	:LXI:EVEN:LOG:COUN?
Range	0 – Size
Initial S/W Revision	Prior to A.02.00

Next Entry (Remote Command Only)

Returns the oldest entry from the LXI Event Log and removes it from the log. If the log is empty, an empty string is returned.

Remote Command	`:LXI:EVENt:LOG[:NEXT]?`
Example	:LXI:EVEN:LOG?
Initial S/W Revision	Prior to A.02.00

All (Remote Command Only)

Non-destructively retrieves the entire contents of the event log. Entries are returned as separate strings, surrounded by double quote marks, and separated by a comma. Fields within each entry are also comma delimited.

Remote Command	`:LXI:EVENt:LOG:ALL?`
Example	:LXI:EVEN:LOG:ALL? Returns the entire event log contents. An example may look like the following: "11/12/2007,18:14:10.770385,Error,LogOverwrite,Rise,,,,","11/12/2007,18:14:10.592105,Status,Measuring,R The contents of the Event Log vary, based on the operation of the instrument.
Initial S/W Revision	Prior to A.02.00

Specific Entry (Remote Command Only)

Non-destructively retrieves a specifically indexed entry from the event log. Fields within an entry are comma delimited.

Remote Command	`:LXI:EVENt:LOG:ENTRy? <intIndex>`
Example	:LXI:EVEN:LOG:ENTR? 0 Returns the first entry in the event log. An example may look like the following: "11/12/2007,18:14:10.770385,Error,LogOverwrite,Rise,,,," The contents of the Event Log vary, based on the operation of the instrument.
Initial S/W Revision	Prior to A.02.00

Beginning Entry (Remote Command Only)

Sets or freezes the beginning entry of the log when in circular mode to the most recently added entry at the time of the command. This is so that the :LXI:EVENt:LOG:ENTtry? command has a reference entry for indexing individual entries in the log.

Remote Command	`:LXI:EVENt:LOG:CIRCular:FBENtry`
Example	:LXI:EVEN:LOG:CIRC:FBEN
Initial S/W Revision	Prior to A.02.00

System Remote Commands (Remote Commands Only)

The commands in this section have no front panel key equivalent

Initial S/W Revision Prior to A.02.00

System Powerdown (Remote Command Only)

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

List installed Options (Remote Command Only)

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

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

Lock the Front-panel keys (Remote Command Only)

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

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

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

Mode	All
Remote Command	`:SYSTem:KLOCk OFF|ON|0|1` `:SYSTem:KLOCk?`
Example	:SYST:KLOC ON
Notes	Keyboard lock remains in effect until turned-off or the instrument is power-cycled
Preset	Initialized to OFF at startup, unaffected by Preset

State Saved	No
Initial S/W Revision	Prior to A.02.00

List SCPI Commands (Remote Command Only)

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

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

SCPI Version Query (Remote Command Only)

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

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

Date (Remote Command Only)

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

Sets or queries the date in the instrument.

Mode	All

Remote Command	`:SYSTem:DATE "<year>,<month>,<day>"`
	`:SYSTem:DATE?`
Example	:SYST:DATE "2006,05,26"
Notes	<year> is the four digit representation of year. (for example, 2006)
	<month> is the two digit representation of year. (for example. 01 to 12)
	<day> is the two digit representation of day. (for example, 01 to 28, 29, 30, or 31) depending on the month and year
Initial S/W Revision	Prior to A.02.00

Time (Remote Command Only)

Sets or queries the time in the instrument.

Mode	All
Remote Command	`:SYSTem:TIME "<hour>,<minute>,<second>"`
	`:SYSTem:TIME?`
Example	:SYST:TIME "13,05,26"
Notes	<hour> is the two digit representation of the hour in 24 hour format
	<minute> is the two digit representation of minute
	<second> is the two digit representation of second
Initial S/W Revision	Prior to A.02.00

Power On

Enables you to select how the instrument should power on. The options are: Mode and Input/Output Defaults, User Preset and Last State.

Key Path	System
Mode	All
Remote Command	`:SYSTem:PON:TYPE MODE|USER|LAST`
	`:SYSTem:PON:TYPE?`
Example	:SYST:PON:TYPE MODE
Preset	MODE
Preset	This is unaffected by a Preset but is set to Mode on a "Restore System Defaults->All"

State Saved	No
Backwards Compatibility SCPI	`:SYSTem:PON:TYPE PRESet` the "PRESet" parameter is supported for backward compatibility only and behaves the same as MODE.
Backwards Compatibility Notes	The Preset Type key in legacy analyzers has been removed, and the Power On toggle key has been replaced by this 1-of-N key in the System menu.
Initial S/W Revision	Prior to A.02.00

Mode and Input/Output Defaults

When the analyzer is powered on in Mode and Input/Output Defaults, it performs a Restore Mode Defaults to all modes in the instrument and also performs a Restore Input/Output Defaults.

Persistent parameters (such as Amplitude Correction tables or Limit tables) are not affected at poweron, even though they are normally cleared by Restore Input/Output Defaults and/or Restore Mode Defaults.

Key Path	System, Power On
Mode	All
Example	SYST:PON:TYPE MODE
Readback Text	Defaults
Initial S/W Revision	Prior to A.02.00

User Preset

Sets Power On to User Preset. When the analyzer is powered on in User Preset, it will User Preset each mode and switch to the power-on mode. Power On User Preset will not affect any settings beyond what a normal User Preset affects.

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

Key Path	System, Power On
Mode	All
Example	SYST:PON:TYPE USER
Readback Text	User Preset
Backwards Compatibility Notes	Power On User Preset will cause the instrument to power up in the power-on mode, not the last mode the instrument was in prior to shutdown. Also, Power On User Preset will User Preset all modes. This does not match legacy behavior exactly.
Initial S/W Revision	Prior to A.02.00

Last State

Sets Power On to Last. When the analyzer is powered on, it will put all modes in the last state they were in prior to when the analyzer was put into Power Standby and it will wake up in the mode it was last in prior to powering off the instrument. The saving of the active mode prior to shutdown happens behind the scenes when a controlled shutdown is requested by using the front panel power Standby key or by using the remote command SYSTem:PDOWn. The non-active modes are saved as they are deactivated and recalled by Power On Last State.

NOTE An instrument can never power up for the first time in Last.

If line power to the analyzer is interrupted, for example by pulling the line cord plug or by switching off power to a test rack, Power On Last State may not work properly. For proper operation, Power On Last State depends on you shutting down the instrument using the Standby key or the SYSTem:PDOWn SCPI command. This will ensure the last state of each mode is saved and can be recalled during a power up. For more information seeError! Reference source not found..

Key Path	System, Power On
Mode	All
Example	SYST:PON:TYPE LAST
Notes	Power on Last State only works if the user has done a controlled shutdown prior to powering on in Last. If a controlled shutdown is not done when in Power On Last State, the

	instrument will power up in the last active mode, but it may not power up in the active mode's last state. If an invalid mode state is detected, a Mode Preset will occur. To control the shutdown under remote control use the :SYSTem:PDOWn command.
Readback Text	Last State
Backwards Compatibility Notes	It is no longer possible to power-up the analyzer in the last mode the analyzer was running with that mode in the preset state. (ESA/PSA SYST:PRESET:TYPE MODE with SYST:PON:PRESET) You can power-on the analyzer in the last mode the instrument was running in its last state (SYST:PON:TYPE LAST), or you can specify the mode to power-up in its preset state (SYST:PON:MODE <mode>).
Initial S/W Revision	Prior to A.02.00

Power On Application

Accesses a menu that lists the available Modes and lets you select which Mode is to be the power-on application.

This application is used for Power On Type "Mode and Input/Output Defaults" and Restore System Defaults All.

Key Path	System, Power On
Mode	All
Remote Command	`:SYSTem:PON:MODE SA | BASIC | ADEMOD | NFIGURE | PNOISE | CDMA2K | TDSCDMA | VSA | VSA89601 | WCDMA | WIMAXOFDMA` `:SYSTem:PON:MODE?`
Example	SYST:PON:MODE SA
Notes	The list of possible modes (and remote parameters) to choose from is dependent on which modes are installed in the instrument.
Preset	SA
Preset	This is unaffected by a Preset but is set on a "Restore System Defaults->All" to SA.
State Saved	No
Initial S/W Revision	Prior to A.02.00

Spectrum Analyzer

Selects the Spectrum Analyzer mode for general purpose measurements. There are several measurements available in this mode. General spectrum analysis measurements, in swept and zero span, can be done using the first key in the Meas menu, labeled Swept SA. Other measurements in the Meas Menu are designed to perform specialized measurement tasks, including power and demod measurements.

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

Key Path	Mode
Example	INST:SEL SA
	INST:NSEL 1
Initial S/W Revision	Prior to A.02.00

IQ Analyzer (Basic)

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

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

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

W-CDMA with HSPA+

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

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

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

GSM/EDGE/EDGE Evo

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

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

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

802.16 OFDMA (WiMAX/WiBro)

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

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

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

Vector Signal Analyzer (VXA)

The N9064A (formerly 89601X) VXA Vector signal and WLAN modulation analysis application provides solutions for basic vector signal analysis, analog demodulation, digital demodulation and WLAN analysis. The digital demodulation portion of N9064A allows you to perform measurements on standard-based formats such as cellular, wireless networking and digital video as well as general purpose flexible modulation analysis for wide range of digital formats, FSK to 1024QAM, with easy-to-use measurements and display tools such as constellation and eye diagram, EVM traces and up to four simultaneous displays. The WLAN portion of N9064A allows you to make RF transmitter measurements on 802.11a/b/g/p/j WLAN devices. Analog baseband analysis is available using the MXA with option BBA.

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

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

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

Phase Noise

The Phase Noise mode provides pre-configured measurements for making general purpose measurements of device phase noise.

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

Key Path	Mode
Example	INST:SEL PNOISE or INST:NSEL 14
Initial S/W Revision	Prior to A.02.00

Noise Figure

The Noise Figure mode provides pre-configured measurements for making general purpose measurements of device noise figure.

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

Key Path	Mode
Example	INST:SEL NFIGURE Or INST:NSEL 219
Initial S/W Revision	Prior to A.02.00

Analog Demod

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

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

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

TD-SCDMA with HSPA/8PSK

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

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

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

cdma2000

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

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

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

1xEV-DO

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

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

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

LTE

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

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

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

DVB-T/H with T2

Selects the DVB-T/H mode for measurements of digital video signals using this format. There are several power and demod measurements available in this mode.

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

Key Path	Mode
Example	INST:SEL DVB
	INST:NSEL 235
Initial S/W Revision	A.02.00
Modified at S/W Revision	A.07.00

DTMB (CTTB)

Selects the DTMB (CTTB) mode for measurements of digital video signals using this format. There are several power and demod measurements available in this mode.

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

Key Path	Mode
Example	INST:SEL DTMB
	INST:NSEL 236
Initial S/W Revision	A.02.00

ISDB-T

Selects the ISDB-T mode for measurements of digital video signals using this format. There are several power and demod measurements available in this mode.

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

Key Path	Mode
Example	INST:SEL ISDBT
	INST:NSEL 239
Initial S/W Revision	A.03.00

CMMB

Selects the CMMB mode for measurements of digital video signals using this format. There are several power and demod measurements available in this mode.

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

Key Path	Mode
Example	INST:SEL CMMB
	INST:NSEL 240
Initial S/W Revision	A.03.00

Combined WLAN

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

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

Key Path	Mode
Example	INST:SEL CWLAN
	INST:NSEL 19
Initial S/W Revision	A.02.00

Combined Fixed WiMAX

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

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

Key Path	Mode
Example	INST:SEL CWIMAXOFDM
	INST:NSEL 81
Initial S/W Revision	A.02.00

802.16 OFDM (Fixed WiMAX)

Selects the 802.16 OFDM (Fixed WiMAX) mode. This mode allows modulation quality measurements of signals that comply with IEEE 802.16a–2003 and IEEE 802.16–2004 standards, with flexibility to measure nonstandard OFDM formats. Along with the typical digital demodulation measurement results, several additional 802.16 OFDM unique trace data formats and numeric error data results provide enhanced data analysis.

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

Key Path	Mode
Example	INST:SEL WIMAXFIXED
	INST:NSEL 104
Initial S/W Revision	A.02.00

iDEN/WiDEN/MOTOTalk

Selects the iDEN/WiDEN/MOTOTalk mode for general purpose measurements of iDEN and iDEN-related signals. There are several measurements available in this mode.

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

Key Path	Mode
Example	INST:SEL IDEN
	INST:NSEL 103
Initial S/W Revision	A.02.00

Remote Language Compatibility

The Remote Language Compatibility (RLC) mode provides remote command backwards compatibility for the 8560 series of spectrum analyzers, known as

legacy spectrum analyzers.

NOTE After changing into or out of this mode, allow a 1 second delay before sending any subsequent commands.

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

Key Path	Mode
Example	INST:SEL RLC
	Or
	INST:NSEL 266
Initial S/W Revision	Prior to A.02.00

SCPI Language Compatibility

The SCPI Language Compatibility mode provides remote language compatibility for SCPI-based instruments, such as the Rohde and Schwartz FSP and related series of spectrum analyzers.

NOTE After changing into or out of this mode, allow a 1 second delay before sending any subsequent commands.

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

Key Path	Mode
Example	INST:SEL SCPILC
	Or
	INST:NSEL 270
Initial S/W Revision	A.06.00

89601 VSA

Selecting the 89601 VSA mode will start the 89600-Series VSA software application. The 89600 VSA software is powerful, PC-based software, offering the

industry's most sophisticated general purpose and standards specific signal evaluation and troubleshooting tools for the R&D engineer. Reach deeper into signals, gather more data on signal problems, and gain greater insight.

For more information see the Agilent 89600 Series VSA web site at www.agilent.com/find/89600

To learn more about how to use the 89600 VSA running in the X-Series, after the 89600 VSA application is running, open the 89600 VSA Help and open the "About Agilent X-Series Signal Analyzers (MXA/EXA) with 89600-Series Software" help topic.

Key Path	Mode
Example	INST:SEL VSA89601
	INST:NSEL 101
Initial S/W Revision	Prior to A.02.00

Bluetooth

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

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

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

Configure Applications

The Configure Applications utility lets you do two things:

There are several reasons you might want to specify a subset of the available applications (Modes) to preload:

The Configure Applications utility can be used to select applications for preload and/or to determine how many applications can fit in memory at one time. This utility consists of a window with instructions, a set of “Select Application” checkboxes, a “fuel bar” style memory gauge, and softkeys that help you set up your configuration.

Preloading Applications

During operation of the analyzer, you select applications from the Mode menu. After startup of the analyzer program, the first time you select a particular application that application must be loaded into memory. Once loaded, the application stays loaded, so the next time you select it during a session, there is no delay. During runtime, if an application which is not yet loaded into memory is selected using the Mode menu or sending SCPI commands, there will be a pause while the Application is loaded. During this pause a message which says “Loading application, please wait ...” is displayed.

You can use the Configure Applications utility to choose applications to “preload” at startup, to eliminate the runtime delay; if you do this, the delay will instead increase the time it takes to start up the analyzer program, but for many users this is preferable to having to wait the first time they select an application. Asking for an application to be preloaded will cause it to be loaded into the analyzer’s memory when the analyzer program starts up. Once it is loaded into memory, it cannot be unloaded without exiting and restarting the analyzer program.

Virtual memory usage

There are more applications available for the X-Series than can fit into memory at any one time, so the Configure Applications utility includes a memory tracker that serves two purposes:

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

2. You can determine how many of your favorite applications can reside in memory at one time.

The utility provides a graphical representation of the amount of memory (note that the memory in question here is Virtual memory and is a limitation imposed by the operating system, not by the amount of physical memory you have in your analyzer). You select applications to preload by checking the boxes on the

left. Checked applications preload at startup. The colored fuel bar indicates the total memory required when all the checked applications are loaded (either preloaded or selected during runtime).

Here is what the fuel bar colors mean:

RED: the applications you have selected cannot all fit into the analyzer's memory. You must deselect applications until the fuel bar turns yellow.

YELLOW: the applications you have selected can all fit into the analyzer's memory, but there is less than 10% of the memory left, probably not enough to load any other applications, either via preload or by selecting a Mode while the analyzer is running..

GREEN: The indicator is green when <90% of the memory limit is consumed. This means the applications you have selected can all fit into the analyzer's memory with room to spare. You will likely be able to load one or more other applications without running out of memory.

Access to Configure Applications utility

You may, at any time, manually call up the Configure Applications utility by pressing System, Power On, Configure Applications, to find a configuration that works best for you, and then restart the analyzer program.

The utility may also be called if, during operation of the analyzer, you attempt to load more applications than can fit in memory at once.

A version of the utility also runs the first time you power up the analyzer after purchasing it from Agilent. In this case the utility automatically configures preloads so that as many licensed applications as possible are preloaded while keeping the total estimated virtual memory usage below the limit. This auto-configuration only takes place at the very first run, and after analyzer software upgrades.

Key Path	System, Power On
Example	:SYST:SHOW CAPP Displays the Config Applications screen
Initial S/W Revision	A.02.00

Select All

Marks all applications in the selection list. This allows you to enable all applications licensed on the instrument for pre-loading, or is a convenience for selecting all applications in one operation and then letting you deselect individual applications.

Key Path	System, Power On, Configure Applications
Initial S/W Revision	A.02.00

Deselect All

Clears the marks from all applications in the selection list, with the exception of the Power On application. The Power On application cannot be eliminated from the pre-load list.

Key Path	System, Power On, Configure Applications
Initial S/W Revision	A.02.00

Move Up

The application list is the order in which applications appear in the Mode Menu. This key enables you to shift the selected application up in the list, thus moving the selected application earlier in the Mode Menu.

Key Path	System, Power On, Configure Applications
Initial S/W Revision	A.02.00

Move Down

The application list is the order in which applications appear in the Mode Menu. This key enables you to shift the selected application down in the list, thus moving the selected application later in the Mode Menu.

Key Path	System, Power On, Configure Applications
Initial S/W Revision	A.02.00

Select/Deselect

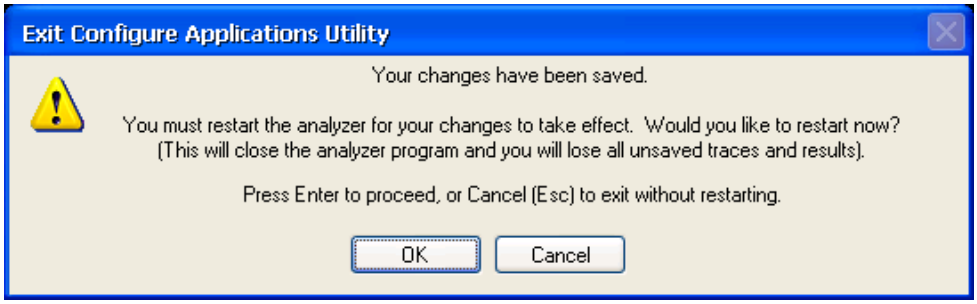
Toggles the currently highlighted application in the list.

Key Path	System, Power On, Configure Applications
Initial S/W Revision	A.02.00

8.3.2.6.6 Save Changes and Exit

Applies the configuration of the applications list. The marked applications will be pre-loaded in memory the next time the instrument application is started, and the order of the applications in the list will be the order of the applications in the Mode Menu.

After saving your changes, the analyzer asks you if you would like it to restart so that your changes can take effect (see dialog box, below). If you choose not to restart, no memory will be released until the next time you shut down and restart the analyzer.



Key Path	System, Power On, Configure Applications
Remote Command	`:SYSTem:PUP:PROCess`
Example	:SYST:PUP:PROC This is the SCPI command for restarting the analyzer. You must Wait after this command for the instrument application to restart
Notes	The softkey will be grayed-out when the virtual memory of the selected applications exceeds 100% of the limit.
Notes	You cannot use *WAI or *OPC? to synchronize operation after a restart. This command stops and restarts the instrument application, thus the SCPI operation is terminated and restarted. A remote program must use fixed wait time to resume sending commands to the instrument. The wait time will be dependent upon which applications are pre-loaded.

Initial S/W Revision	A.02.00
Modified at S/W Revision	A.04.00

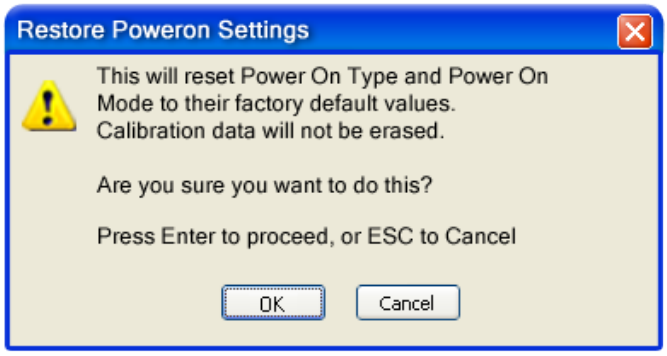
8.3.2.6.7 Exit Without Saving

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

Key Path	System, Power On, Configure Applications
Initial S/W Revision	A.02.00
Modified at S/W Revision	A.04.00

Restore Power On Defaults

This selection causes the Power On Type and Power On Application settings to be a reset to their default values. This level of Restore System Defaults does not affect any other system settings, mode settings and does not cause a mode switch. The Power On key, under the Restore System Defaults menu, causes the same action.



If you press any key other than OK or Enter, it is construed as a Cancel, because the only path that will actually cause the reset to be executed is through OK or Enter.

Key Path	System, Power On
Example	:SYST:DEF PON
Initial S/W Revision	Prior to A.02.00

Configure Applications - Instrument boot-up

At start-up of the analyzer programa dialog box similar to the one under the System, Power On, Configure Applications key will be displayed allowing you to choose which licensed applications are to be loaded. This dialog will only be displayed if the memory required to pre-load all of the licensed applications exceeds the Virtual Memory available.

Configure Applications - Windows desktop

The Configure Applications Utility may be run from the Windows Desktop. The utility is launched by double-clicking the 

icon on the desktop, which brings-up a dialog box similar to the one under the System, Power On, Configure Applications key, allowing you to choose which licensed applications are to be loaded when the analyzer program starts up. This dialog box has mouse buttons on it which do the job that the softkeys normally do in the System, Power On, Configure Applications menu.

Configure Applications - Remote Commands

The following topics provide details on the using remote commands to configure the list of applications want to load into the instrument memory or query the Virtual Memory utilization for your applications.

Configuration list (Remote Command Only)

This remote command is used to set or query the list of applications to be loaded in-memory.

Remote Command	`:SYSTem:PON:APPLication:LLISt <string of INSTrument:SELect names>` `:SYSTem:PON:APPLication:LLISt?`
Example	:SYST:PON:APPL:LLIS "SA,BASIC,WCDMA"
Notes	<string of INSTrument:SELect names> are from the enums of the :INSTrument:SELect command. The order of the <INSTrument:SELect names> is the order in which the applications are loaded into memory, and the order in which they appear in the Mode Menu. Error message –225 "Out of Memory" is reported when more applications are listed than can reside in Virtual Memory. When this occurs, the existing applications load list is unchanged.
Preset	Not affected by Preset
State Saved	Not saved in instrument state
Initial S/W Revision	A.02.00

Configuration Memory Available (Remote Command Only)

This remote command is used to query the amount of Virtual Memory remaining.

Remote Command	`:SYSTem:PON:APPLication:VMEMory[:AVAilable]?`
Example	:SYST:PON:APPL:VMEM?
Preset	Not affected by Preset
Initial S/W Revision	A.02.00

Configuration Memory Total (Remote Command Only)

This remote command is used to query the limit of Virtual Memory allowed for applications.

Remote Command	`:SYSTem:PON:APPLication:VMEMory:TOTal?`
Example	:SYST:PON:APPL:VMEM:TOT?
Preset	Not affected by Preset
Initial S/W Revision	A.02.00

Configuration Memory Used (Remote Command Only)

This remote command is a query of the amount of Virtual Memory used by all measurement applications.

Remote Command	`:SYSTem:PON:APPLication:VMEMory:USED?`
Example	:SYST:PON:APPL:VMEM:USED?
Preset	Not affected by Preset
Initial S/W Revision	A.02.00

Configuration Application Memory (Remote Command Only)

This remote command is used to query the amount of Virtual Memory a particular application consumes.

Remote Command	`:SYSTem:PON:APPLication:VMEMory:USED:NAME? <INSTrument:SELect name>`
Example	:SYST:PON:APPL:VMEM:USED:NAME? CDMA2K
Notes	<INSTrument:SELect name> is from the enums of the :INSTrument:SELect command in Meas Common section 13.3 Value returned will be 0 (zero) if the name provided is invalid.
Preset	Not affected by Preset
Initial S/W Revision	Prior to A.02.00

Alignments

The Alignments Menu controls and displays the automatic alignment of the instrument, and provides the ability to restore the default alignment values.

The current setting of the alignment system is displayed in the system Settings Panel along the top of the display, including a warning icon for conditions that may cause specifications to be impacted.

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

Auto Align

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

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

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

Key Path	System, Alignments
Mode	All
Remote Command	`:CALibration:AUTO ON|PARTial|OFF` `:CALibration:AUTO?`
Example	:CAL:AUTO ON
Notes	While Auto Align is executing, bit 0 of Status Operation register is set.
Couplings	Auto Align is set to Off if Restore Align Data is invoked.
Preset	ON
Preset	This is unaffected by Preset but is set to ON upon a "Restore System Defaults->Align".
State Saved	No
Status Bits/OPC dependencies	When Auto Align is executing, bit 0 in the Status Operational register is set.
Backwards Compatibility SCPI	`:CALibration:AUTO ALERt` Parameter ALERt is for backward compatibilityonly and is mapped to PARTial
Backwards Compatibility Notes	1. ESA SCPI for Auto Align is :CALibration:AUTO <Boolean>. The command for X-Series is an enumeration. Thus the parameters of "0" and "1" are not possible in X-Series. 2. Similarly, the ESA SCPI for :CALibration:AUTO? returned the Boolean value 1 or 0, in X-Series it is an Enumeration (string). Thus, queries by customer applications into numeric variables will result in an error 3. In PSA Auto Align OFF was not completely off, it is equivalent to PARTial in X-Series. In X-Series, OFF will be fully OFF. This means users of PSA SCPI who choose OFF may see degraded performance and should migrate their software to use PARTial.
Initial S/W Revision	Prior to A.02.00

Normal

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

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

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

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

Key Path	System, Alignments, Auto Align
Mode	All
Example	:CAL:AUTO ON
Notes	Alignment processing as a result of the transition to Normal will be executed sequentially. Thus, *OPC? or *WAI following CAL:AUTO ON will return when the alignment processing is complete. The presence of an external signal may interfere with the RF portion of the alignment. If so, the Error Condition message “Align skipped: 50 MHz interference” or “Align skipped: 4.8 GHz interference” is reported, and bit 11 is set in the Status Questionable Calibration register. After the interfering signal is removed, subsequent alignment of the RF will clear the condition, and clear bit 11 in the Status Questionable Calibration register.
Readback Text	Normal
Status Bits/OPC dependencies	An interfering user signal may prevent automatic alignment of the RF subsystem. If this occurs, the Error Condition message “Align skipped: 50 MHz interference” or “Align skipped: 4.8 GHz interference” is reported, the Status Questionable Calibration bit 11 is set, and the alignment proceeds. When a subsequent alignment of the RF subsystem succeeds, either by the next cycle of automatic alignment or from an Align Now, RF, the Error Condition and Status Questionable Calibration bit 11 are cleared.
Initial S/W Revision	Prior to A.02.00

Partial

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

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

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

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

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

Off

Auto Align, Off disables automatic alignment and the maintenance of warranted operation, for the benefit of maximum measurement throughput. With Auto Align set to Off, you are now responsible for maintaining warranted operation by

updating the alignments when they expire. The Auto Align, Alert mechanism will notify you when alignments have expired. One solution to expired alignments is to perform the Align All, Now operation. Another is to return the Auto Align selection to Normal.

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

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

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

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

All but RF

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

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

Key Path	System, Alignments, Auto Align
Mode	All
Remote Command	`:CALibration:AUTO:MODE ALL|NRF` `:CALibration:AUTO:MODE?`
Example	:CAL:AUTO:MODE NRF
Preset	ALL
Preset	This is unaffected by Preset but is set to ALL on a "Restore System Defaults->Align".
State Saved	No
Readback Text	RF or NRF
Initial S/W Revision	Prior to A.02.00

Alert

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

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

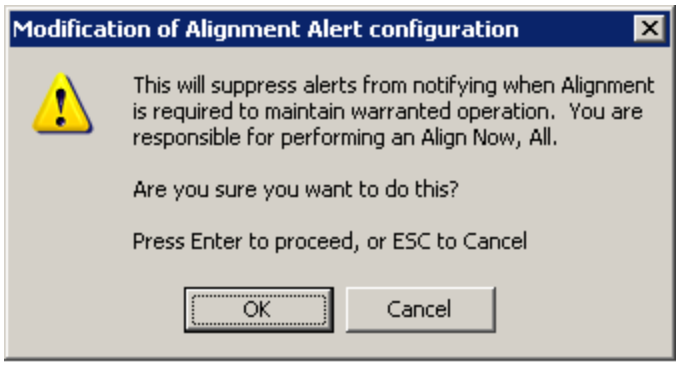
Key Path	System, Alignments, Auto Align
Mode	All
Remote Command	`:CALibration:AUTO:ALERt TTEMperature|DAY|WEEK|NONE` `:CALibration:AUTO:ALERt?`
Example	:CAL:AUTO:ALER TTEM
Notes	The alert that alignment is needed is the setting of bit 14 in the Status Questionable Calibration register.
Preset	TTEMperature

Preset	This is unaffected by Preset but is set to TTEMperature on a "Restore System Defaults->Align".
State Saved	No
Status Bits/OPC dependencies	The alert is the Error Condition message "Align Now, All required" and bit 14 is set in the Status Questionable Calibration register.
Initial S/W Revision	Prior to A.02.00

24 hours

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

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



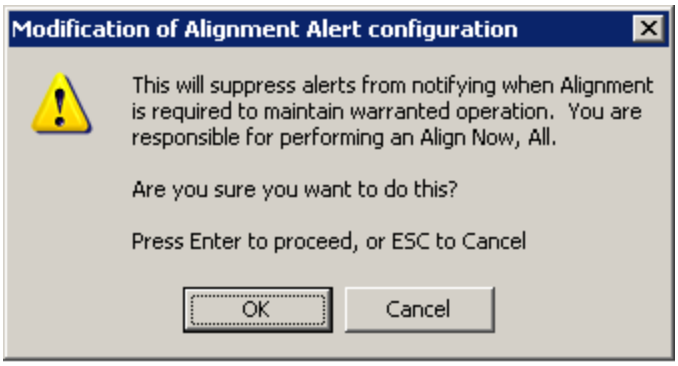
No confirmation is required when Alert is configured through a remote command.

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

7 days

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

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



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

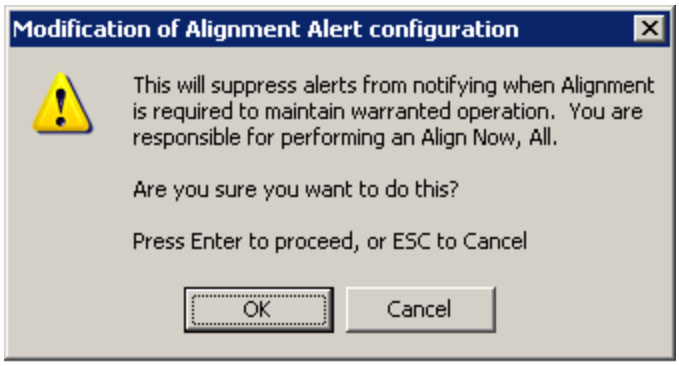
Key Path	System, Alignments, Auto Align, Alert
Mode	All
Example	:CAL:AUTO:ALER WEEK
Readback Text	7 days
Status Bits/OPC dependencies	Bit 14 is set in the Status Questionable Calibration register.
Initial S/W Revision	Prior to A.02.00

None

With Auto Align Alert set to None the instrument will not signal an alert. This is provided for rare occasions where you are making a long measurement which cannot tolerate Auto Align interruptions, and must have the ability to capture a

screen image at the end of the measurement without an alert posted to the display. Agilent does not recommends using this selection in any other circumstances, because of the risk of accuracy performance drifting well beyond expected levels without the operator being informed.

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



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

Key Path	System, Alignments, Auto Align, Alert
Mode	All
Example	:CAL:AUTO:ALER NONE
Initial S/W Revision	Prior to A.02.00

Time & Temperature

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

Key Path	System, Alignments, Auto Align, Alert
Mode	All
Example	:CAL:AUTO:ALER TTEM

Readback Text	Time & Temp
Status Bits/OPC dependencies	Bit 14 is set in the Status Questionable Calibration register.
Initial S/W Revision	Prior to A.02.00

Align Now

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

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

All

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

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

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

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

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

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

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

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

Key Path	System, Alignments, Align Now
Mode	All
Remote Command	`:CALibration[:ALL]`
	`:CALibration[:ALL]?`
Example	:CAL
Notes	:CALibration[:ALL]? returns 0 if successful
	:CALibration[:ALL]? returns 1 if failed
	:CALibration[:ALL]? is the same as *CAL?
	While Align Now, All is performing the alignment, bit 0 in the Status Operation register is set. Completion, or termination, will clear bit 0 in the Status Operation register.

	This command is sequential; it must complete before further SCPI commands are processed. Interrupting the alignment from remote is accomplished by invoking Device Clear followed by the :ABORt command. Successful completion will clear bit 14 in the Status Questionable Calibration register. An interfering user signal is not grounds for failure of Align Now, All. However, bits 11 and 12 are set in the Status Questionable Calibration register to indicate Align Now, RF is required. An interfering user supplied signal will result in the instrument requiring an Align Now, RF with the interfering signal removed.
Couplings	Initializes the time for the Last Align Now, All Time. Records the temperature for the Last Align Now, All Temperature. If Align RF component succeeded, initializes the time for the Last Align Now, RF Time. If Align RF component succeeded, records the temperature for the Last Align Now, RF Temperature.
Status Bits/OPC dependencies	Bits 11, 12, or 14 may be set in the Status Questionable Calibration register.
Initial S/W Revision	Prior to A.02.00

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

All but RF

Immediately executes an alignment of all subsystems except the RF subsystem. The instrument will stop any measurement currently underway, perform the alignment, and then restart the measurement from the beginning (similar to pressing the Restart key). This can be used to align portions of the instrument that are not impacted by an interfering user input signal.

This operation might be chosen instead of All if you do not want the device under test to experience a large change in input impedance, such as a temporary open circuit at the analyzer input.

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

Successful completion of Align Now, All but RF will clear the “Align Now, All required” Error Condition, and clear bit 14 in the Status Questionable Calibration register. If “Align Now, All required” was in effect prior to executing the All but RF, the Error Condition message “Align Now, RF required” is generated and bit 12 in the Status Questionable Calibration register is set. It will also begin the elapsed time counter for Last Align Now, All Time, and capture the Last Align Now, All Temperature.

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

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

Key Path	System, Alignments, Align Now
Mode	All
Remote Command	`:CALibration:NRF`
	`:CALibration:NRF?`

Example	:CAL:NRF
Notes	:CALibration:NRF? returns 0 if successful
	:CALibration:NRF? returns 1 if failed
	While Align Now, All but RF is performing the alignment, bit 0 in the Status Operation register is set. Completion, or termination, will clear bit 0 in the Status Operation register.
	This command is sequential; it must complete before further SCPI commands are processed. Interrupting the alignment from remote is accomplished by invoking Device Clear followed by the :ABORt command.
	Successful completion will clear bit 14 in the Status Questionable Calibration register and set bit 12 if invoked with "Align Now, All required".
Couplings	Initializes the time for the Last Align Now, All Time.
	Records the temperature for the Last Align Now, All Temperature.
Status Bits/OPC dependencies	Bits 12 or 14 may be set in the Status Questionable Calibration register.
Initial S/W Revision	Prior to A.02.00

RF

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

This operation might be desirable if the alignments had been set to not include RF alignments, or if previous RF alignments could not complete because of interference which has since been removed.

If an interfering user signal is present at the RF Input, the alignment will terminate and generate the Error Condition message "Align skipped: 50 MHz interference" or "Align skipped: 4.8 GHz interference", and Error Condition "Align Now, RF required". In addition, bits 11 and 12 will be set in the Status Questionable Calibration register.

The query form of the remote commands (:CALibration:RF?) will invoke the alignment of the RF subsystem and return a success or failure value. An interfering user signal is grounds for failure.

Successful completion of Align Now, RF will begin the elapsed time counter for Last Align Now, RF Time, and capture the Last Align Now, RF Temperature.

Align Now, RF can be interrupted by pressing the Cancel (ESC) front-panel key or remotely with Device Clear followed by the :ABORt SCPI command. When this occurs, the Error Condition message “Align Now, RF required” is generated, and bit 12 is set in the Status Questionable Condition register. None of the new alignment data is used.

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

Key Path	System, Alignments, Align Now
Mode	All
Remote Command	`:CALibration:RF` `:CALibration:RF?`
Example	:CAL:RF
Notes	:CALibration:RF? returns 0 if successful :CALibration:RF? returns 1 if failed (including interfering user signal) While Align Now, RF is performing the alignment, bit 0 in the Status Operation register is set. Completion, or termination, will clear bit 0 in the Status Operation register. This command is sequential; it must complete before further SCPI commands are processed. Interrupting the alignment from remote is accomplished by invoking Device Clear followed by the :ABORt command. Successful completion clears the Error Conditions “Align skipped: 50 MHz interference” and “Align skipped: 4800 MHz interference” and the Error Conditions “Align RF failed” and “Align Now, RF required”, and clears bits 3, 11, and 12 in the Status Questionable Calibration register. A failure encountered during alignment will generate the Error Condition message “Align RF failed” and set bit 3 in the Status Questionable Calibration register. An interfering user signal will result in bits 11 and 12 to be set in the Status Questionable Calibration register to indicate Align Now, RF is required. An interfering user supplied signal will result in the instrument requiring an Align Now, RF with the interfering signal removed.
Couplings	Initializes the time for the Last Align Now, RF Time. Records the temperature for the Last Align Now, RF Temperature.
Status	Bits 11, 12, or 14 may be set in the Status Questionable Calibration register.

Bits/OPC dependencies

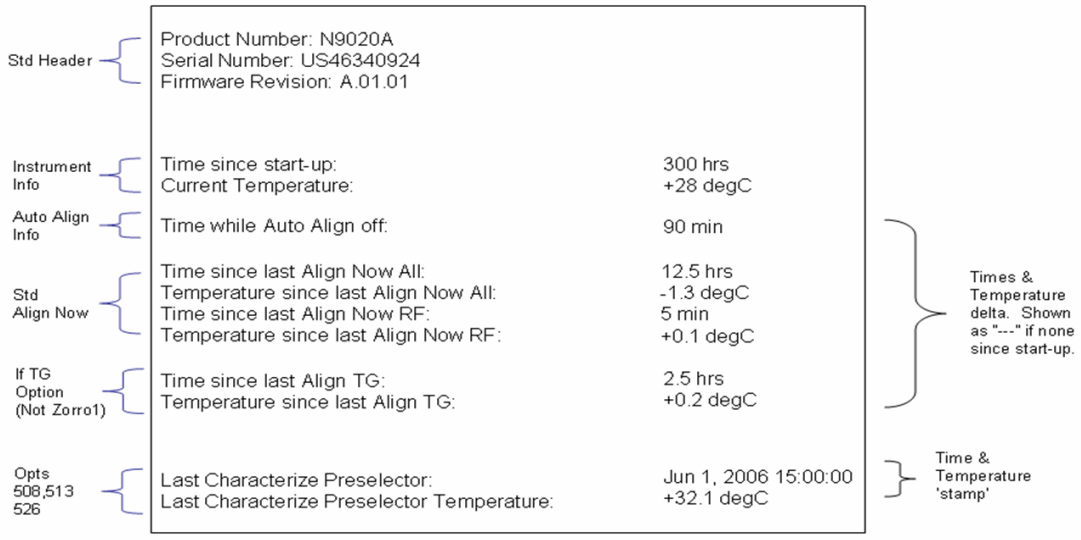
Initial S/W Revision Prior to A.02.00

Show Alignment Statistics

Shows alignment information you can use to ensure that the instrument is operating in a specific manner. The Show Alignment Statistics screen is where you can view time and temperature information.

Values which are displayed are only updated when the Show Alignment Statistics screen is invoked, they are not updated while the Show Alignment Statistics screen is being displayed. The remote commands which access this information obtain current values.

An example of the Show Alignment Statistics screen would be similar to:



A successful Align Now, RF will set the Last Align RF temperature to the current temperature, and reset the Last Align RF time. A successful Align Now, All or Align Now, All but RF will set the Last Align Now All temperature to the current temperature, and reset the Last Align Now All time. A successful Align Now, All

will also reset the Last Align RF items if the RF portion of the Align Now succeeded.

Key Path	System, Alignments
Mode	All
Notes	The values displayed on the screen are only updated upon entry to the screen and not updated while the screen is being displayed.
Initial S/W Revision	Prior to A.02.00

Key Path	Visual annotation in the Show Alignment Statistics screen
Mode	All
Remote Command	`:SYSTem:PON:TIME?`
Example	:SYST:PON:TIME?
Notes	Value is the time since the most recent start-up in seconds.
State Saved	No
Initial S/W Revision	Prior to A.02.00

Key Path	Visual annotation in the Show Alignment Statistics screen
Mode	All
Remote Command	`:CALibration:TEMPerature:CURRent?`
Example	:CAL:TEMP:CURR?
Notes	Value is in degrees Centigrade. Value is invalid if using default alignment data (Align Now, All required)
State Saved	No
Initial S/W Revision	Prior to A.02.00

Key Path	Visual annotation in the Show Alignment Statistics screen
Mode	All
Remote Command	`:CALibration:TIME:LALL?`
Example	:CAL:TIME:LALL?
Notes	Value is the elapsed time, in seconds, since the last successful Align Now, All or Align

	Now, All but RF was executed.
State Saved	No
Initial S/W Revision	Prior to A.02.00

Key Path	Visual annotation in the Show Alignment Statistics screen
Mode	All
Remote Command	`:CALibration:TEMPerature:LALL?`
Example	:CAL:TEMP:LALL?
Notes	Value is in degrees Centigrade at which the last successful Align Now, All or Align Now, All but RF was executed.
State Saved	No
Initial S/W Revision	Prior to A.02.00

Key Path	Visual annotation in the Show Alignment Statistics screen
Mode	All
Remote Command	`:CALibration:TIME:LRF?`
Example	:CAL:TIME:LRF?
Notes	Value is the elapsed time, in seconds, since the last successful Align Now, RF was executed, either individually or as a component of Align Now, All.
State Saved	No
Initial S/W Revision	Prior to A.02.00

Key Path	Visual annotation in the Show Alignment Statistics screen
Mode	All
Remote Command	`:CALibration:TEMPerature:LRF?`
Example	:CAL:TEMP:LRF?

Notes	Value is in degrees Centigrade at which the last successful Align Now, RF was executed, either individually or as a component of Align Now, All.
State Saved	No
Initial S/W Revision	Prior to A.02.00

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

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

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

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

Key Path	Visual annotation in the Show Alignment Statistics screen
Mode	All
Remote Command	`:CALibration:TEMPerature:RFPSelector:LCONducted?`
Example	:CAL:TEMP:RFPS:LCON?
State Saved	No
Restriction and Notes	Value is in degrees Centigrade at which the last successful Align Now, 20 Hz – 30 MHz was executed.

Key Path	Visual annotation in the Show Alignment Statistics screen
Mode	All
Remote Command	`:CALibration:TIME:RFPSelector:LRADiated?`

Example	:CAL:TIME:RFPS:LRAD?
State Saved	No
Restriction and Notes	Value is the date and time the last successful Align Now, 30 MHz – 3.6 GHz was executed. The date is separated from the time by a semi-colon character.

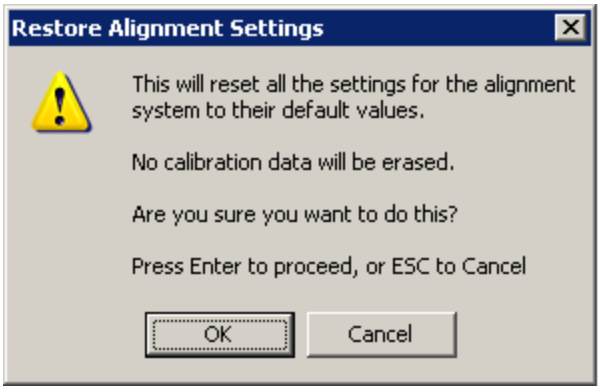
Key Path	Visual annotation in the Show Alignment Statistics screen
Mode	All
Remote Command	`:CALibration:TEMPerature:RFPSelector:LRADiated?`
Example	:CAL:TEMP:RFPS:LRAD?
State Saved	No
Restriction and Notes	Value is in degrees Centigrade at which the last successful Align Now, 30 MHz – 3.6 GHz was executed.

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

Restore Align Defaults

Initializes the alignment user interface settings, not alignment data, to the factory default values. Align Now, All must be executed if the value of the Timebase DAC results in a change.

For front panel operation, you are prompted to confirm action before setting the alignment parameters to factory defaults:



The parameters affected are:

Parameter	Setting
Timebase DAC	Calibrated
Timebase DAC setting	Calibrated value
Auto Align State	Normal (if the instrument is not operating with default alignment data, Off otherwise)
Auto Align All but RF	Off
Auto Align Alert	Time & Temperature

Key Path	System, Alignments
Mode	All
Example	:SYST:DEF ALIG

Notes	Alignment processing that results as the transition to Auto Alignment Normal will be executed sequentially; thus *OPC? or *WAI will wait until the alignment processing is complete.
Initial S/W Revision	Prior to A.02.00

Backup or Restore Align Data...

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

Alignment data for the instrument resides on the hard drive in a database. Agilent uses high quality hard drives; however it is highly recommended the alignment data be backed-up to storage outside of the instrument. Additionally, for customers who use multiple CPU Assemblies or multiple disk drives, the alignment that pertains to the instrument must be transferred to the resident hard drive after a CPU or hard drive is replaced. This utility facilitates backing-up and restoring the alignment data.

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

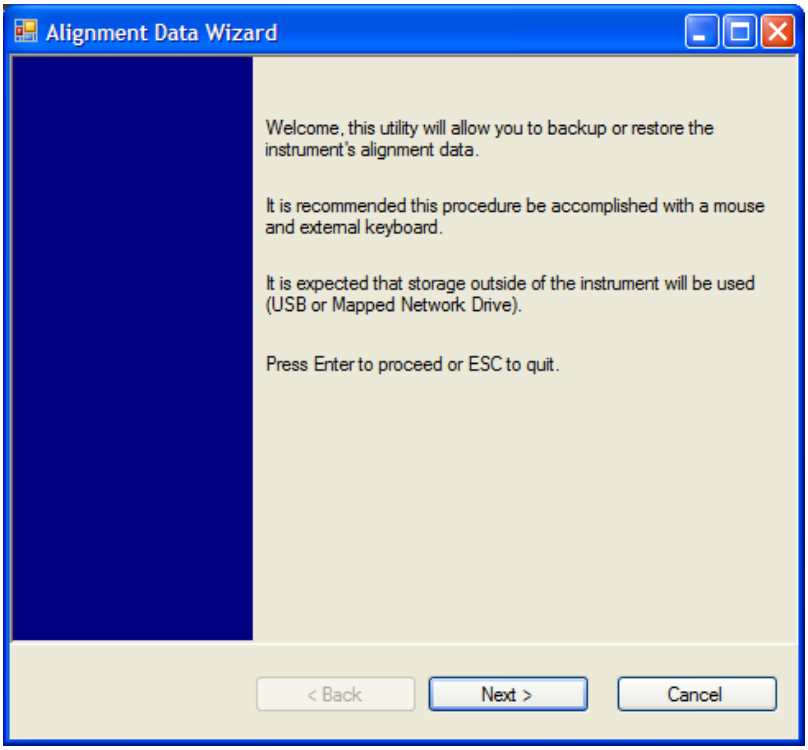
Key Path	System, Alignments
Initial S/W Revision	A.02.00

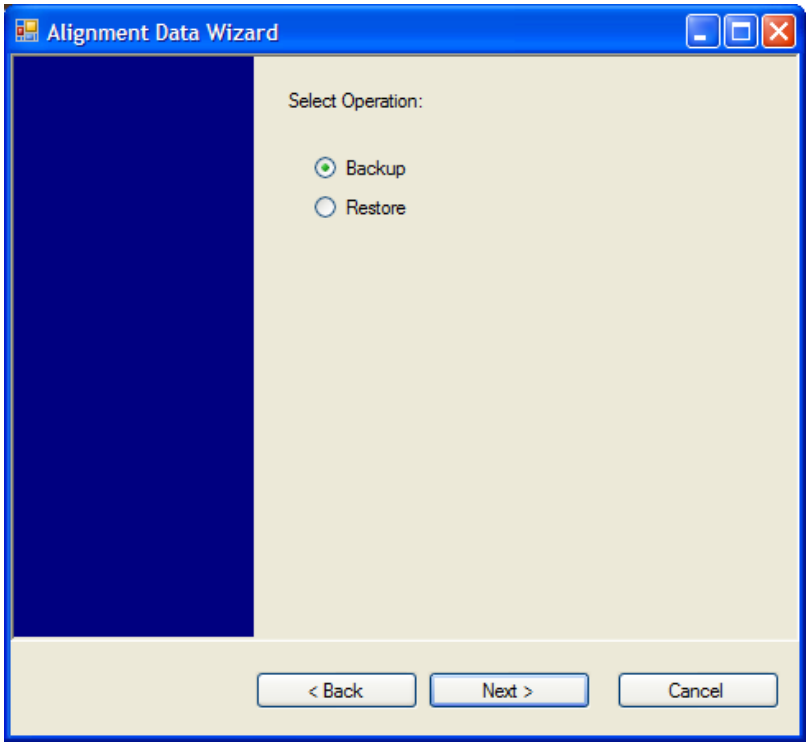
Key Path	System, Alignments
Mode	All
Remote Command	`:CALibration:DATA:DEFault`
Example	:CAL:DATA:DEF
Couplings	Sets Auto Align to Off. Sets bit 14 in the Status Questionable Calibration register. The Error Condition message “Align Now, All required” is generated.
Initial S/W Revision	Prior to A.02.00

Alignment Data Wizard

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

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

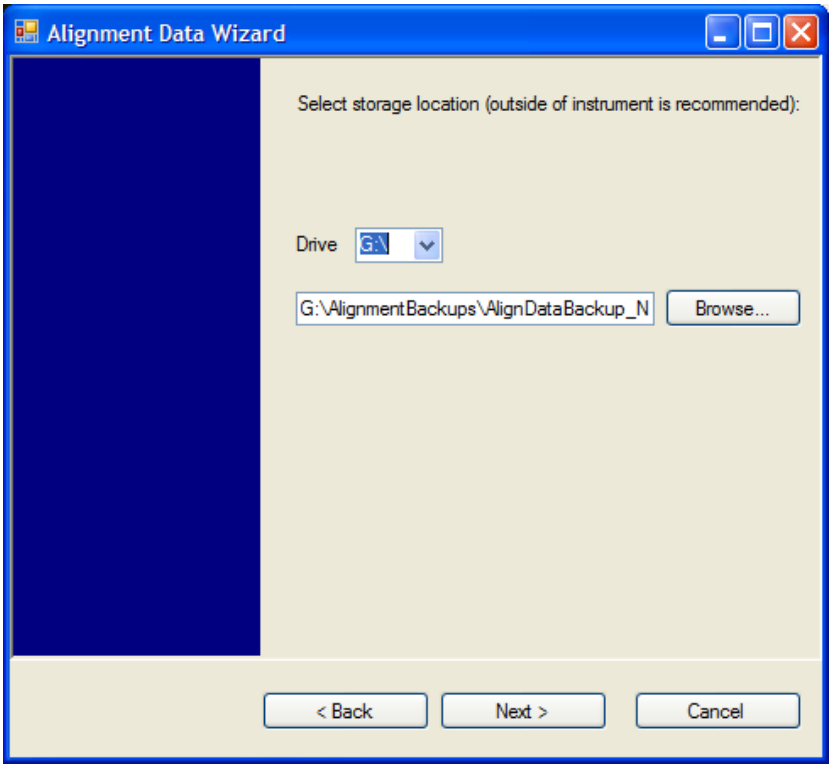




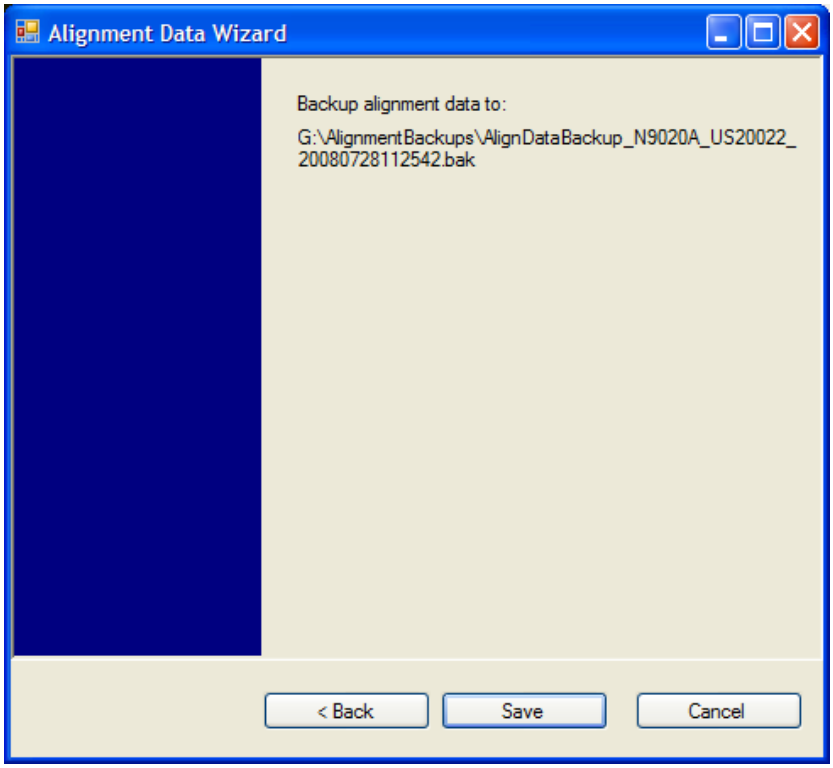
The backup screen will indicate the approximate amount of space required to contain the backup file.

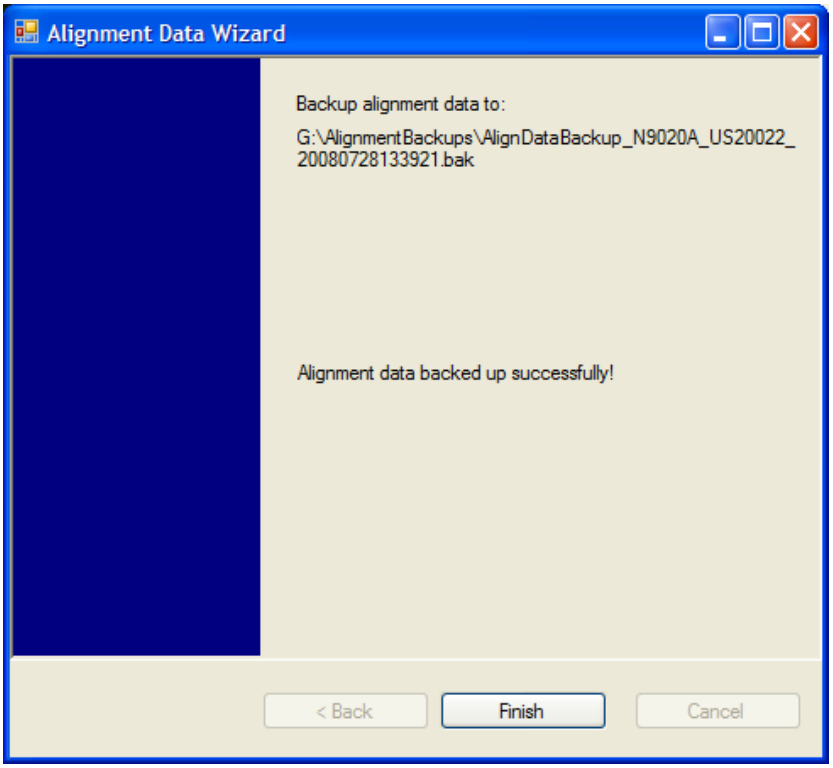
The default file name will be AlignDataBackup_<model number>_<serial number>_<date in YYYYMMDDHHMMSS>.bak.

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



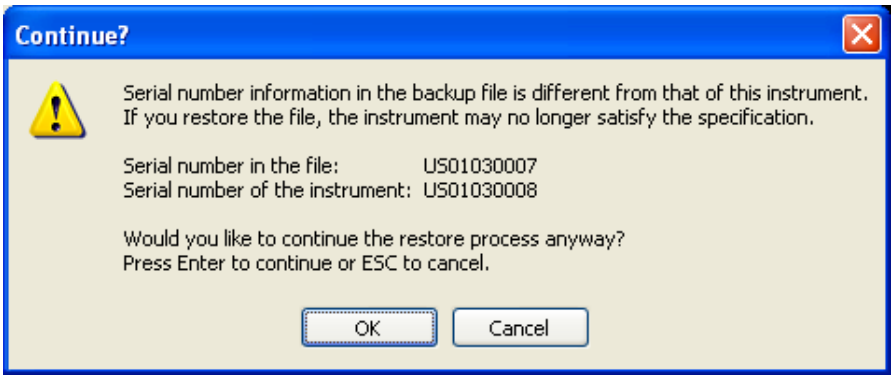
Changing the drive letter will also modify the path displayed in the box below. When this step is first loaded, the drive drop-down is populated with connected drives which provide the user with write access. If there are many unreachable network drives connected to the instrument, this step can take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


Alignment Data Wizard
Backup alignment data to:
G:\AlignmentBackups\AlignDataBackup_N9020A_US20022_20080728112542.bak
< Back
Save
Cancel

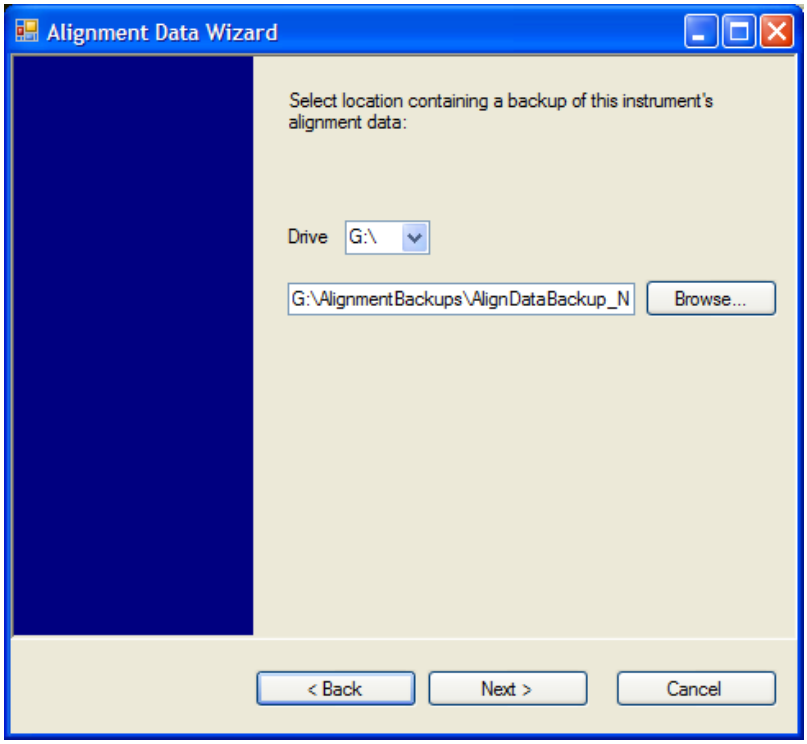


The restore operation will check the validity of the restore file using the database's built-in file validation. If the restore file is corrupt, the existing alignment data will remain in use.

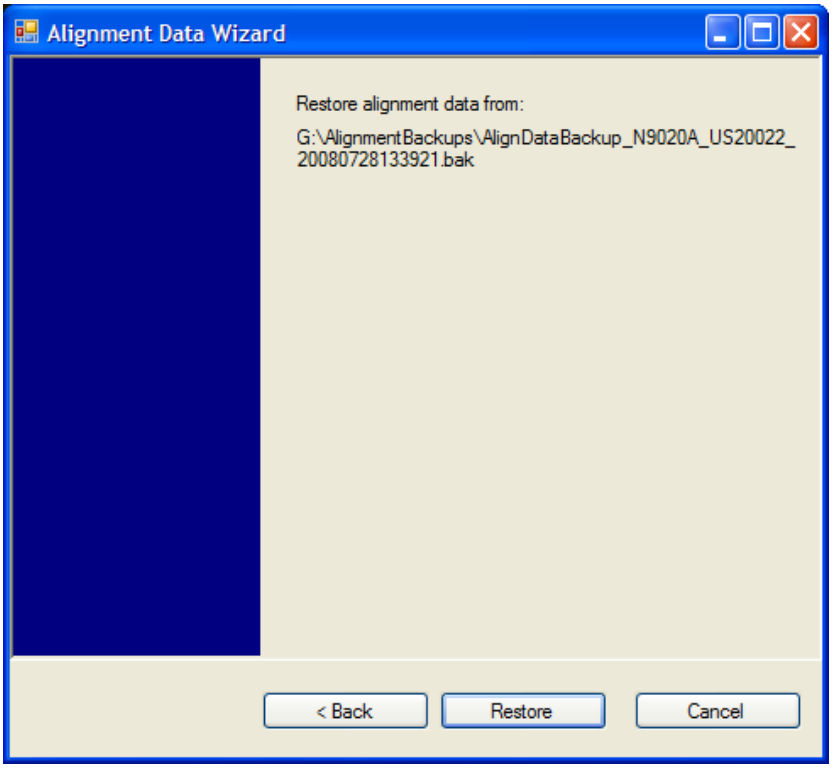
If the serial number information in the backup file being restored is different from that of the instrument, the following message appears (the serial number shown are examples):

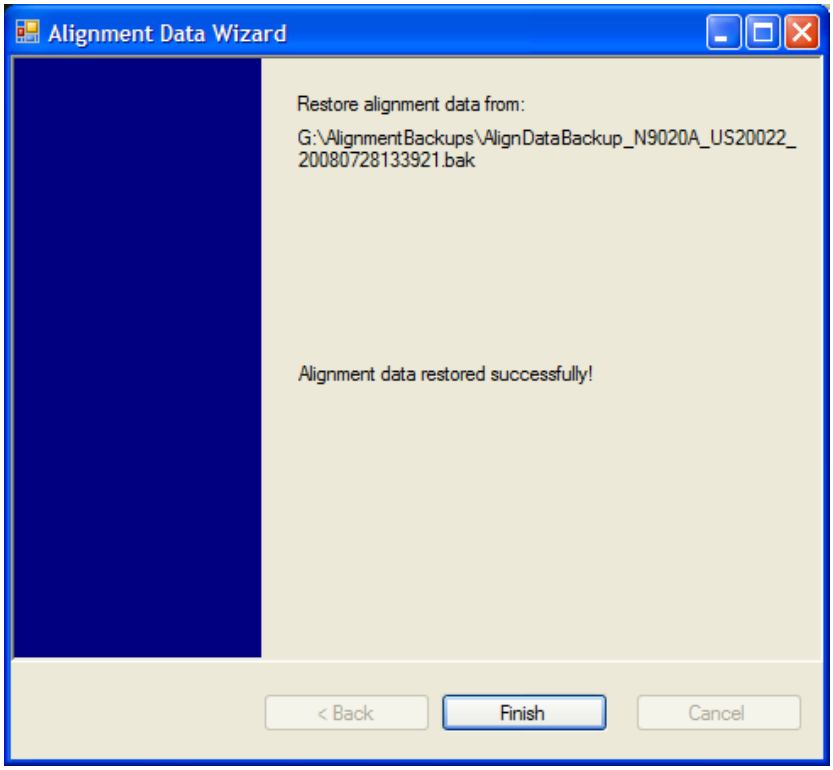


For the N9030A, the default restore location will be the internal F: drive which is a solid-state memory device located internally on the instrument. The default restore file will be the most recent file that matches the default backup file name format: AlignDataBackup_N9030A_<serial number>_<date>.bak



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


Alignment Data Wizard
Restore alignment data from:
G:\AlignmentBackups\AlignDataBackup_N9020A_US20022_20080728133921.bak
< Back
Restore
Cancel



Perform Backup (Remote Command Only)

Invokes an alignment data backup operation to the provided Folder.

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

Remote Command `:CALibration:DATA:BACKup <filename>`

Example :CAL:DATA:BACK "F:\AlignDataBackup_N9020A_US00000001_2008140100.bak"

Initial S/W Revision A.02.00

Perform Restore (Remote Command Only)

Invokes an alignment data restore operation from the provided filename.

Remote Command :CALibration:DATA:RESTore <filename>

Example :CAL:DATA:REST "F:\ AlignDataBackup_N9020A_US00000001_2008140100.bak "

Initial S/W Revision A.02.00

Advanced

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

Key Path System, Alignments

Initial S/W Revision Prior to A.02.00

Characterize Preselector

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

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

Characterize Preselector immediately executes a characterization of the Preselector, which is a YIG-tuned filter (YTF). The instrument stops any measurement currently underway, performs the characterization, then restarts the measurement from the beginning (similar to pressing the Restart key).

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

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

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

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

Key Path	System, Alignments, Advanced
Mode	All
Remote Command	`:CALibration:YTF` `:CALibration:YTF?`
Example	:CAL:YTF
Notes	:CALibration:YTF? returns 0 if successful :CALibration:YTF? returns 1 if failed (including interfering user signal) While Advanced, Characterize Preselector is performing the alignment, bit 0 in the Status Operation register is set. Completion, or termination, will clear bit 0 in the Status Operation register. This command is sequential; it must complete before further SCPI commands are processed. Interrupting the alignment from remote is accomplished by invoking Device Clear followed by the :ABORt command. Successful completion will clear bit 9 in the Status Questionable Calibration register. A failure encountered during alignment will generate the Error Condition message “Characterize Preselector failed” and set bit 9 in the Status Questionable Calibration register. For Options that support frequencies > 3.6 GHz only.
Dependencies	This key does not appear in models that do not contain preselectors. In these models the SCPI command is accepted without error but no action is taken.

Couplings	Initializes the time for the Last Characterize Preselector Time. Records the temperature for the Last Characterize Preselector Temperature.
Initial S/W Revision	Prior to A.02.00

Timebase DAC

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

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

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

Calibrated

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

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

User

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

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

Key Path	System, Alignments, Timebase DAC
Mode	All
Remote Command	`:CALibration:FREQuency:REFerence:FINE <integer>` `:CALibration:FREQuency:REFerence:FINE?`
Example	:CAL:FREQ:REF:FINE 8191
Notes	If the value of the timebase is changed the alignment system automatically performs an alignment or alerts that an alignment is due.
Couplings	Setting :CAL:FREQ:REF:FINE sets :CAL:FREQ:REF:MODE USER
Preset	This is unaffected by Preset but is set to the factory setting on a “Restore System Defaults->Align”.
State Saved	No
Min	0

Max	16383
Backwards Compatibility SCPI	`:CALibration:FREQuency:REFerence:COARse` ESA hardware contained two DAC controls for the Timebase. In X-Series the command :CALibration:FREQuency:REFerence:FINE is the method for adjusting the timebase. The :COARse command is provided as an alias to :FINE.
Initial S/W Revision	Prior to A.02.00

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

RF Preselector

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

Align Now, 20 Hz to 30 MHz

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

The query form of the remote commands (:CALibration:RFPSelector:CONDucted?) will invoke the alignment of the RF Preselector on Conducted Band and return a success or failure value. Successful completion will clear the “Align 20 Hz to 30 MHz required” Error Condition, and clear the bit 1 in the Status Questionable Calibration Extended Needed register. The elapsed time counter will begin for Last Align Now, Conducted Time, and the temperature is captured for the Last Align Now, Conducted Temperature. The alignment can be interrupted by pressing the Cancel (ESC) front-panel key or remotely with Device Clear followed

by the :ABORt SCPI command. When this occurs, the Error Condition “Align 20 Hz to 30 MHz required” is set because new alignment data may be employed for an individual subsystem, but not a cohesive set of data for all subsystems.

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

Key Path	System, Alignments, RF Preselector, Align Now
Mode	All
Remote Command	`:CALibration:RFPSelector:CONDucted` `:CALibration:RFPSelector:CONDucted?`
Example	:CAL:RFPS:COND
Notes	:CALibration:RFPSelector:CONDucted? Return 0 if successful :CALibration:RFPSelector:CONDucted? Return 1 if failed When Align 20 Hz to 30 MHz is performing the alignment, bit 0 in the Status Operation register is set. Completion, or termination, will clear bit 0 in the Status Operation register. This command is sequential; it must complete before further SCPI commands are processed. Interrupting the alignment from remote is accomplished by invoking Device Clear followed by the :ABORt command. Successful completion will clear bit 1 in the Status Questionable Calibration Extended Needed register and bit 0 in Status Questionable Calibration Extended Failure register. A failure encountered during alignment will set the Error Condition “20 Hz to 30 MHz Alignment Failure” and set both bit 1 in the Status Questionable Calibration Extended Needed register and bit 9 in Status Questionable Calibration register. For model N9038A only.
Dependencies	This key does not appear in other than N9038A models, setting or querying the SCPI will generate an error.
Couplings	Initializes the time for the Last Align Conducted Now, Conducted Time. Records the temperature for the Last Align Conducted Now, Conducted Temperature.
Status Bits/OPC Dependencies	Bit 8 or 9 may be set in the Status Questionable Calibration register. Bit 1 may be set in the Status Questionable Calibration Extended Needed register. Bit 0 may be set in the Status Questionable Calibration Extended Failure register.
Initial S/W Revision	A.08.00

Align Now, 30 MHz to 3.6 GHz

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

The query form of the remote commands (:CALibration:RFPSelector:RADiated?) will invoke the alignment of the RF Preselector on Radiated Band and return a success or failure value. Successful completion will clear the "Align 30 MHz to 3.6 GHz required" Error Condition, and clear the bit 2 in the Status Questionable Calibration Extended Needed register. The elapsed time counter will begin for Last Align Now, Radiated Time, and the temperature is captured for the Last Align Now, Radiated Temperature. The alignment can be interrupted by pressing the Cancel (ESC) front-panel key or remotely with Device Clear followed by the :ABORt SCPI command. When this occurs, the Error Condition "Align 30 MHz to 3.6 GHz required" is set because new alignment data may be employed for an individual subsystem, but not a cohesive set of data for all subsystems.

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

Key Path	System, Alignments, RF Preselector, Align Now
Mode	All
Remote Command	`:CALibration:RFPSelector:RADiated` `:CALibration:RFPSelector:RADiated?`
Example	:CAL:RFPS:RAD
Notes	:CALibration:RFPSelector:RADiated? Return 0 if successful :CALibration:RFPSelector:RADiated? Return 1 if failed When Align 30 MHz to 3.6 GHz is performing the alignment, bit 0 in the Status Operation register is set. Completion, or termination, will clear bit 0 in the Status Operation register. This command is sequential; it must complete before further SCPI commands are processed. Interrupting the alignment from remote is accomplished by invoking Device Clear followed by the :ABORt

	command. Successful completion will clear bit 2 in the Status Questionable Calibration Extended Needed register and bit 1 in Status Questionable Calibration Extended Failure register. A failure encountered during alignment will set the Error Condition "30 MHz to 3.6 GHz Alignment Failure" and set both bit 2 in the Status Questionable Calibration Extended Needed register and bit 9 in Status Questionable Calibration register. For model N9038A only.
Dependencies	This key does not appear in other than N9038A models, setting or querying the SCPI will generate an error.
Couplings	Initializes the time for the Last Align Radiated Now, Radiated Time. Records the temperature for the Last Align Radiated Now, Radiated Temperature.
Status Bits/OPC Dependencies	Bit 8 or 9 may be set in the Status Questionable Calibration register. Bit 2 may be set in the Status Questionable Calibration Extended Needed register. Bit 1 may be set in the Status Questionable Calibration Extended Failure register.
Initial S/W Revision	A.08.00

Align Now, 20 Hz to 3.6 GHz

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

The query form of the remote commands (:CALibration:RFPSelector:FULL?) will invoke the alignment of the RF Preselector on both Conducted and Radiated Band and return a success or failure value. Successful completion will clear the "Align 20 Hz to 3.6 GHz required" Error Condition, and clear the bit 1 and bit 2 in the Status Questionable Calibration Extended Needed register. The elapsed time counter will begin for Last Align Now, Conducted Time and Last Align Now Radiated Time and the temperature is captured for Last Align Now, Conducted Temperature and Last Align Now, Radiated Temperature. The alignment can be interrupted by pressing the Cancel (ESC) front-panel key or remotely with Device Clear followed by the :ABORt SCPI command. When this occurs, the Error Condition "Align 20 Hz to 3.6 GHz required" is set because new alignment data may be employed for an individual subsystem, but not a cohesive set of data for all subsystems.

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

Key Path	System, Alignments, RF Preselector, Align Now
Mode	All
Remote Command	`:CALibration:RFPSelector:FULL` `:CALibration:RFPSelector:FULL?`
Example	:CAL:RFPS:FULL
Notes	:CALibration:RFPSelector:FULL? Return 0 if successful :CALibration:RFPSelector:FULL? Return 1 if failed When Align 20 Hz to 3.6 GHz is performing the alignment, bit 0 in the Status Operation register is set. Completion, or termination, will clear bit 0 in the Status Operation register. This command is sequential; it must complete before further SCPI commands are processed. Interrupting the alignment from remote is accomplished by invoking Device Clear followed by the :ABORt command. Successful completion will clear bit 1, bit 2 in the Status Questionable Calibration Extended Needed register and bit 0, bit 1 in Status Questionable Calibration Extended Failure register. A failure encountered during alignment will set the Error Condition “20 Hz to 3.6 GHz Alignment Failure” and set bit1, bit 2 in the Status Questionable Calibration Extended Needed register and bit 9 in Status Questionable Calibration register. For model N9038A only.
Dependencies	This key does not appear in other than N9038A models, setting or querying the SCPI will generate an error.
Couplings	Initializes the time for the Last Align Conducted Now, Conducted Time. Initializes the time for the Last Align Radiated Now, Radiated Time. Records the temperature for the Last Align Conducted Now, Conducted Temperature. Records the temperature for the Last Align Radiated Now, Radiated Temperature.
Status Bits/OPC Dependencies	Bit 8 or 9 may be set in the Status Questionable Calibration register. Bit 1 and 2 may be set in the Status Questionable Calibration Extended Needed register. Bit 0 and 1 may be set in the Status Questionable Calibration Extended Failure register.
Initial S/W Revision	A.08.00

Alert

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

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

Schedule Setup

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

Key Path	System, Alignments, RF Preselector
Initial S/W Revision	A.08.00

Date/Time

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

Key Path	System, Alignments, RF Preselector, Schedule Setup

Mode	All
Remote Command	:CALibration:RFPSelector:SCHeduler:TIME:STARt "date","time"
	:CALibration:RFPSelector:SCHeduler:TIME:STARt?
	This query returns data using the following format "YYYY/MM/DD; HH:MM:SS"
Example	:CAL:RFPS:SCH:TIME:STAR "2009/8/20","12:00:00"
Notes	"date" is representation of the date the task will run in the form of "YYYY/MM/DD" where:
	-YYYY is the four digit representation of year. (for example, 2009)
	-MM is the two digit representation of month. (for example, 01 to 12)
	-DD is the two digit representation of the day. (for example, 01 to 28, 29, 30 or 31 depending on the month and year)
	"time" is a representation of the time of day the task will run in the form of "HH:MM:SS" where:
	-HH is the two digit representation of the hour in 24 hour format
	-MM is the two digit representation of minute
	-SS is the two digit representation of seconds
	For model N9038A only.
Preset	00:00:00
Preset	This is unaffected by Preset but is set to Current date and 00:00:00 on a "Restore System Defaults->Align".
State Saved	No
Initial S/W Revision	A.08.00

Date

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

Key Path	System, Alignments, RF Preselector, Schedule Setup, Date/Time
Notes	See section 2.3.1.2.4.2
	For model N9038A only.
Preset	Current date
Preset	This is unaffected by Preset but is set to Current date and 00:00:00 on a "Restore System Defaults->Align".

State Saved	No
Initial S/W Revision	A.08.00

Time

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

Key Path	System, Alignments, RF Preselector, Schedule Setup, Date/Time
Notes	See section 2.3.1.2.4.2
	For model N9038A only.
Preset	00:00:00
Preset	This is unaffected by Preset but is set to Current date and 00:00:00 on a "Restore System Defaults->Align".
State Saved	No
Initial S/W Revision	A.08.00

Recurrence

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

Key Path	System, Alignments, RF Preselector, Schedule Setup
Mode	All
Remote Command	`:CALibration:RFPSelector:SCHeduler:RECurrence DAY|WEEK|OFF` `:CALibration:RFPSelector:SCHeduler:RECurrence?`
Example	:CAL:RFPS:SCH:REC DAY
Notes	For model N9038A only.
Preset	This is unaffected by Preset but is set to OFF on a "Restore System Defaults->Align".
State Saved	No

Range	DAY | WEEK | OFF
Initial S/W Revision	A.08.00

Every N Weeks

Configure the scheduler to run the task on a day in every number of week's duration.

Key Path	System, Alignments, RF Preselector, Schedule Setup, Recurrence
Initial S/W Revision	A.08.00

N of Weeks

Set the number of week's duration the scheduler will trigger a task.

Key Path	System, Alignments, RF Preselector, Schedule Setup, Recurrence, Every N Weeks
Mode	All
Remote Command	`:CALibration:RFPSelector:SCHeduler:RECurrence:WEEK <integer>` `:CALibration:RFPSelector:SCHeduler:RECurrence:WEEK?`
Example	:CAL:RFPS:SCH:REC:WEEK 2
Notes	New scheduled date to run the alignment task will get updated when this parameter is changed. For model N9038A only.
Preset	This is unaffected by Preset but is set to 1 on a "Restore System Defaults->Align".
State Saved	No
Range	1–52
Initial S/W Revision	A.08.00

Day

Set the Day of the Week the scheduler will run a scheduled task.

Key Path	System, Alignments, RF Preselector, Schedule Setup, Recurrence, Every N Weeks
Mode	All
Remote	`:CALibration:RFPSelector:SCHeduler:RECurrence:DAY SUN | MON | TUE`

Command	`| WED | THU | FRI | SAT` `:CALibration:RFPSelector:SCHeduler:RECurrence:DAY?`
Example	:CAL:RFPS:SCH:REC:DAY SUN
Notes	For model N9038A only.
Preset	This is unaffected by Preset but is set to SUN on a “Restore System Defaults->Align”.
State Saved	No
Range	Sunday | Monday | Tuesday | Wednesday | Thursday | Friday | Saturday
Initial S/W Revision	A.08.00

Task

There is Task 1 to 3 to be selected for the scheduler to run. Task 1 is the 20 Hz to 30 MHz alignment, Task 2 is the 30 MHz to 3.6 GHz alignment and Task 3 is the 20 Hz to 3.6 GHz alignment.

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

Scheduler

Setting the Scheduler to ON will trigger the execution of the scheduled task based on the recurrence and time set in the scheduler since the last successful

of the specific alignment. A warning condition of “RF Preselector alignment scheduler is ON” will be appeared when the scheduler is set to ON. OFF will turn off the Scheduler from running any scheduled task.

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

I/O Config

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

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

GPIB

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

Key Path	System, I/O Config
Initial S/W Revision	A.02.00

GPIB Address

Select the GPIB remote address.

Key Path	System, I/O Config, GPIB

Mode	All
Remote Command	`:SYSTem:COMMunicate:GPIB[1][:SELF]:ADDRess <integer>`
	`:SYSTem:COMMunicate:GPIB[1][:SELF]:ADDRess?`
Example	:SYST:COMM:GPIB:ADDR 17
Notes	Changing the Address on the GPIB port requires all further communication to use the new address.
Preset	18
Preset	This is unaffected by Preset but is set to 18 on a “Restore System Defaults->Misc”
State Saved	No
Range	0 to 30
Initial S/W Revision	Prior to A.02.00

GPIB Controller

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

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

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

Key Path	System, I/O Config, GPIB
Mode	All
Scope	Mode Global
Remote Command	`:SYSTem:COMMunicate:GPIB[1][:SELF]:CONTroller[:ENABle] ON | OFF | 0 | 1`

```
:SYSTem:COMMunicate:GPIB[1][:SELF]:CONTroller[:ENABle]?
```

Example	:SYST:COMM:GPIB:CONT ON Will set GPIB port to Controller
Notes	When the instrument becomes the Controller bit 0 in the Standard Event Status Register is set (and when the instrument relinquishes Controller capability bit 0 is cleared in the Standard Event Status Register).
Preset	OFF
Preset	This is unaffected by Preset but is set to OFF on a “Restore System Defaults->Misc”
State Saved	No
Range	Disabled|Enabled
Initial S/W Revision	A.02.00

Enabled

Enables the GPIB Controller capability.

Key Path	System, I/O Config, GPIB, GPIB Controller
Example	:SYST:COMM:GPIB:CONT ON Will set GPIB port to Controller
Initial S/W Revision	A.02.00

Disabled

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

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

SCPI LAN

Activates a menu for identifying and changing the SCPI over a LAN configuration. There are a number of different ways to send SCPI remote commands to the instrument over LAN. It can be a problem to have multiple

users simultaneously accessing the instrument over the LAN. These keys limit that somewhat by disabling the telnet, socket, and/or SICL capability.

Key Path	System, I/O Config
Initial S/W Revision	Prior to A.02.00

SCPI Telnet

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

Key Path	System, I/O Config, SCPI LAN
Mode	All
Remote Command	`:SYSTem:COMMunicate:LAN:SCPI:TELNet:ENABle OFF|ON|0|1` `:SYSTem:COMMunicate:LAN:SCPI:TELNet:ENABle?`
Example	:SYST:COMM:LAN:SCPI:TELN:ENAB OFF
Preset	ON
Preset	This is unaffected by Preset but is set to ON with a "Restore System Defaults->Misc"
State Saved	No
Range	On | Off
Initial S/W Revision	Prior to A.02.00

SCPI Socket

Turns the capability of establishing Socket LAN sessions On or Off. This allows you to limit SCPI access over LAN through socket sessions.

Key Path	System, I/O Config, SCPI LAN
Mode	All
Remote Command	`:SYSTem:COMMunicate:LAN:SCPI:SOCKet:ENABle OFF|ON|0|1` `:SYSTem:COMMunicate:LAN:SCPI:SOCKet:ENABle?`
Example	:SYST:COMM:LAN:SCPI:SOCK:ENAB OFF
Preset	ON

Preset	This is unaffected by a Preset but is set to ON with a “Restore System Defaults->Misc”
State Saved	No
Range	On | Off
Initial S/W Revision	Prior to A.02.00

SICL Server

Turns the SICL server capability On or Off, enabling you to limit SCPI access over LAN through the SICL server. (SICL IEEE 488.2 protocol.)

Parameter	Description	Setting
Maximum Connections	The maximum number of connections that can be accessed simultaneously	5
Instrument Name	The name (same as the remote SICL address) of your analyzer	inst0
Instrument Logical Unit	The unique integer assigned to your analyzer when using SICL LAN	8
Emulated GPIB Name	The name (same as the remote SICL address) of the device used when communicating with your analyzer	gpib7
Emulated GPIB Logical Unit	The unique integer assigned to your device when it is being controlled using SICL LAN	8
Emulated GPIB Address	The emulated GPIB address assigned to your transmitter tester when it is a SICL server (the same as your GPIB address)	18

Key Path	System, I/O Config, SCPI LAN
Mode	All
Remote Command	`:SYSTem:COMMunicate:LAN:SCPI:SICL:ENABle OFF|ON|0|1` `:SYSTem:COMMunicate:LAN:SCPI:SICL:ENABle?`
Example	:SYST:COMM:LAN:SCPI:SICL:ENAB OFF
Preset	ON
Preset	This is unaffected by Preset, but is set to ON with a “Restore System Defaults->Misc”

State Saved	No
Range	On | Off
Initial S/W Revision	Prior to A.02.00

SCPI Socket Control Port (Remote Command Only)

Returns the TCP/IP port number of the control socket associated with the SCPI socket session. This query enables you to obtain the unique port number to open when a device clear is to be sent to the instrument. Every time a connection is made to the SCPI socket, the instrument creates a peer control socket. The port number for this socket is random. The user must use this command to obtain the port number of the control socket. To force a device clear on this socket, open the port and send the string “DCL ” to the instrument.

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

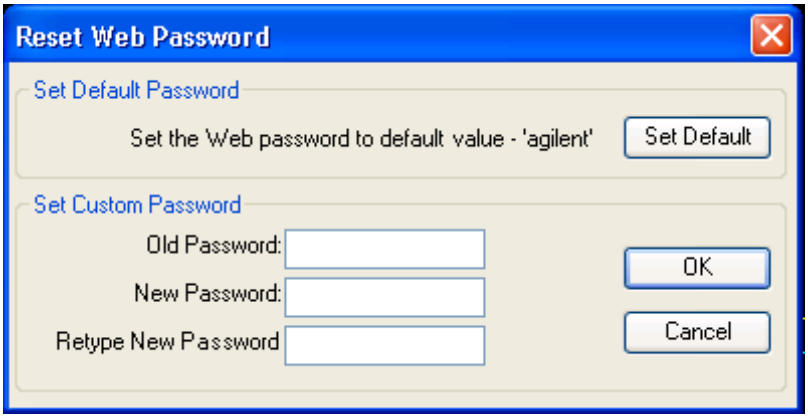
Mode	All
Remote Command	`:SYSTem:COMMunicate:LAN:SCPI:SOCKet:CONTrol?`
Example	:SYST:COMM:LAN:SCPI:SOCK:CONT?
Preset	This is unaffected by Preset or “Restore System Defaults->Misc”.
State Saved	No
Range	0 to 65534
Initial S/W Revision	Prior to A.02.00

Reset Web Password

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

Selecting Reset web password brings up a control for resetting the password as the user desires, or to the factory default. A keyboard is required to change the

password from the factory default of ‘agilent’ or to set a new password that contains alphabetic characters. The control is:



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

Key Path	System, I/O Config
Mode	All
Initial S/W Revision	Prior to A.02.00

LXI

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

Key Path	System, I/O Config
Initial S/W Revision	Prior to A.02.00

LAN Reset

Resets the LAN connection.

Key Path	System, I/O Config, LXI
Initial S/W Revision	Prior to A.02.00

LXI Output LAN Events

The device can be configured to send LXI LAN Events as the instrument's state changes. Specifically, it can notify other devices as the status signals WaitingForTrigger, Sweeping, Measuring, OperationComplete, and Recalling transition. Additionally, Output LAN Events can be sent in response to the receipt of any of the Input LAN Events.

This is the entry point for the LXI Output LAN Event system. This key branches to a list of events that can be sent out on the LAN in response to instrument events.

Key Path	System, I/O Config, LXI
Initial S/W Revision	Prior to A.02.00

Source

Sets the instrument event that this LXI Output LAN event is tied to.

The possible instrument events are "WaitingForTrigger", "Sweeping", "Measuring", "OperationComplete", and "Recalling".

The key is labeled with the value of the selected source.

For the instrument event specific LXI Output LAN Events "WaitingForTrigger," "Sweeping," "Measuring," "OperationComplete," and "Recalling," this parameter is set to the corresponding source value and cannot be changed. For these events, the Source key does not appear.

WaitingForTrigger, Measuring, and Sweeping correspond to the standard trigger state machine activities for which they are named.

OperationComplete is low when a measurement operation is underway. For example, OperationComplete is low throughout a list sweep measurement, even though Sweeping, Measuring, and WaitingForTrigger will undergo a number of transitions. In this case, OperationComplete goes high when the entire list sweep is finished.

Recalling is high while the instrument is actively recalling a state.

Additionally, the Source parameter can be set to the name of any Input LAN Event. This causes the Output LAN Event to be sent upon receipt of the named Input LAN Event. There is no front panel support for these events.

The default list of available Input LAN Events is:

Key Path	System, I/O Config, LXI, LXI Output LAN Events, LAN[n]
Remote Command	`:LXI:EVENt[:OUTPut]:LAN[:SET]:SOURce "LANEVENT", "SourceEvent"` `:LXI:EVENt[:OUTPut]:LAN[:SET]:SOURce? "LANEVENT"`
Example	:LXI:EVEN:LAN:SOUR "LANEVENT","WaitingForTrigger"
Notes	The maximum length of the string is 45 characters.
Preset	"Sweeping" (The Output LAN Events "WaitingForTrigger", "Sweeping", "Measuring", "OperationComplete", and "Recalling" all have default source parameters that match their names)
Preset	Not affected by a Preset. The default values can be restored by pressing Restore Defs, Input/Output Settings. Preset/Default values: "Sweeping" (The Output LAN Events "WaitingForTrigger", "Sweeping", "Measuring", "OperationComplete", and "Recalling" all have default source parameters that match their names)
State Saved	Saved in instrument state.
Range	"WaitingForTrigger" | "Sweeping" | "Measuring" | "OperationComplete" | "Recalling" | "LAN0" | "LAN1" | "LAN2" | "LAN3" | "LAN4" | "LAN5" | "LAN6" | "LAN7" | any user-added Input LAN Event
Initial S/W Revision	Prior to A.02.00

Drive

Determines the behavior of an output event.

Key Path	System, I/O Config, LXI, LXI Output LAN Events, LAN[n]
Remote Command	`:LXI:EVENt[:OUTPut]:LAN[:SET]:DRIVe "LANEVENT", OFF | NORMal | WOR` `:LXI:EVENt[:OUTPut]:LAN[:SET]:DRIVe? "LANEVENT"`
Example	:LXI:EVEN:LAN:DRIV "LANEVENT",WOR

Preset	NORMal
Preset	Not affected by a Preset. The default value of "NORMal" can be restored by using the command: :SYSTem:DEFault INPut
State Saved	Saved in instrument state.
Range	OFF | NORMal | WOR
Initial S/W Revision	Prior to A.02.00

Slope

Determines which instrument event transition results in a LAN packet being sent and whether or not that edge is inverted.

When the Drive parameter is set to Normal, a Slope of Negative causes both edges to be inverted before they are transmitted. A Positive Slope transmits the edges unaltered.

When the Drive parameter is set to WOR, only Positive edges are transmitted. When the Slope is Negative, a falling edge is inverted and sent as a rising edge. When the Slope is Positive, a rising edge is sent normally.

The following table illustrates the effects of the Slope and Drive parameters.

Instrument Event Edge	Slope Parameter	Drive Parameter	Action
0	Negative	Off	Not sent
0	Positive	Off	Not sent
1	Negative	Off	Not sent
1	Positive	Off	Not sent
0	Negative	Normal	1
0	Positive	Normal	0
1	Negative	Normal	0
1	Positive	Normal	1
0	Negative	Wired OR	1
0	Positive	Wired OR	Not sent
1	Negative	Wired OR	Not sent
1	Positive	Wired OR	0

Key Path	System, I/O Config, LXI, LXI Output LAN Events, LAN[n]
Remote Command	`:LXI:EVENt[:OUTPut]:LAN[:SET]:SLOPe "LANEVENT", POSitive | NEGative` `:LXI:EVENt[:OUTPut]:LAN[:SET]:SLOPe? "LANEVENT"`
Example	:LXI:EVEN:LAN:SLOP "LANEVENT",POS
Preset	POSitive
Preset	Not affected by a Preset. The default value of "Positive" can be restored by using the command: :SYSTem:DEFault INPut
State Saved	Saved in instrument state.
Range	POSitive|NEGative
Initial S/W Revision	Prior to A.02.00

Enabled

If this parameter is set to ON, this LAN Event is sent when the selected Source instrument event occurs.

Otherwise, this LAN Event is never output.

Key Path	System, I/O Config, LXI, LXI Output LAN Events, LAN[n]
Remote Command	`:LXI:EVENt[:OUTPut]:LAN[:SET]:ENABled "LANEVENT",ON|OFF|1|0` `:LXI:EVENt[:OUTPut]:LAN[:SET]:ENABled? "LANEVENT"`
Example	:LXI:EVEN:LAN:ENAB "LAN0",ON
Preset	OFF
Preset	Not affected by a Preset. The default value of "OFF" can be restored by using the command: :SYSTem:DEFault INPut
State Saved	Saved in instrument state.
Range	OFF|ON|0|1
Initial S/W Revision	Prior to A.02.00

Disable All

This command causes the Enable property of all members of the LXI Output LAN Event List to be set to OFF.

Key Path	System, I/O Config, LXI, LXI Output LAN Events
Remote Command	`:LXI:EVENt[:OUTPut]:LAN:DISable:ALL`
Example	:LXI:EVEN:LAN:DIS:ALL
Initial S/W Revision	Prior to A.02.00

System IDN Response

This key allows you to specify a response to the *IDN? query, or to return the analyzer to the Factory response if you have changed it.

To choose the factory-set response, press the Factory key.

To specify your own response, press the User key, and enter your desired response.

Key Path	System, I/O Config
Mode	All
Remote Command	`:SYSTem:IDN <string>` `:SYSTem:IDN?`
Notes	• This affects the response given in all Modes of the Analyzer, unless the current Mode has also specified a custom response, in which case the current Mode's custom IDN response takes precedence over the System's, but only while that Mode is the current Mode.. • It survives shutdown and restart of the software and therefore survives a power cycle • Null string as parameter restores the Factory setting
Preset	This is unaffected by Preset but is set to the original factory setting on a "Restore System Defaults->Misc"
State Saved	No
Initial S/W Revision	A.06.00

Factory

This key selects the factory setting, for example:

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

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

Key Path	System, I/O Config, IDN Response
Example	:SYST:IDN "" null string, restores the factory setting
Initial S/W Revision	A.06.0

User

This key allows you to specify your own response to the *IDN? query. You may enter your desired response with the Alpha Editor or a plugin PC keyboard.

When you press this key, the active function becomes the current User string with the cursor at the end. This makes it easy to edit the existing string.

If you enter a null string (for example, by clearing the User String while editing and then pressing Done) the analyzer automatically reverts to the Factory setting.

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

Query USB Connection (Remote Command Only)

Enables you to determine the speed of the USB connection.

Mode	All
Remote Command	`:SYSTem:COMMunicate:USB:CONNection?`
Example	:SYST:COMM:USB:CONN?
Notes	NONE – Indicates no USB connection has been made.

LSPeed – Indicates a USB low speed connection (1.5 Mbps). This is reserved for future use, the T+M488 protocol is not supported on low speed connections.

HSPeed – Indicates that a USB high speed connection (480 Mbps) has been negotiated.

FSPeed – Indicates that a USB full speed connection (12 Mbps) has been negotiated.

State Saved No

Range NONE | LSPeed | HSPeed | FSPeed

Initial S/W Revision Prior to A.02.00

USB Connection Status (Remote Command Only)

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

Mode All

Remote Command `:SYSTem:COMMunicate:USB:STATus?`

Example :SYST:COMM:USB:STAT?

Notes SUSPended – Indicates that the USB bus is currently in its suspended state. The bus is in the suspended state when:

- The bus is not connected to any controller
- The controller is currently powered off
- The controller has explicitly placed the USB device into the suspended state.

When in the suspended state, no USB activity, including start of frame packets are received.

ACTive – Indicates that the USB device is in the active state. When the device is in the active state, it is receiving periodic start of frames but it isn't necessarily receiving or transmitting data.

State Saved No

Range SUSPended | ACTive

Initial S/W Revision Prior to A.02.00

USB Packet Count (Remote Command Only)

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

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

Restore Defaults

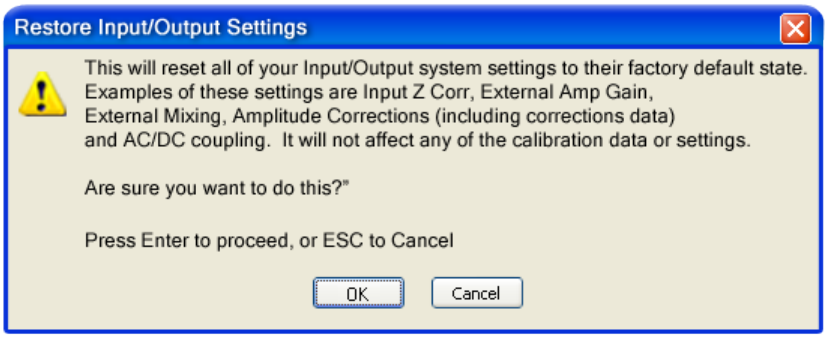
Provides incremental initialization of the system setting groups along with supporting a comprehensive reset of the entire instrument back to a factory default state. The menu selections are the groups of system settings and when one is selected, that particular group of system settings is reset back to their default values.

Key Path	System
Mode	All
Remote Command	`:SYSTem:DEFault [ALL]|ALIGn|INPut|MISC|MODes|PON`
Example	SYST:DEF
State Saved	No
Initial S/W Revision	Prior to A.02.00

Restore Input/Output Defaults

Causes the group of settings and data associated with Input/Output front-panel key to be a reset to their default values. This level of Restore System Defaults does not affect any other system settings, mode settings and does not cause a mode switch. .

Confirmation is required to restore the Input/Output setting. The confirmation dialog is:

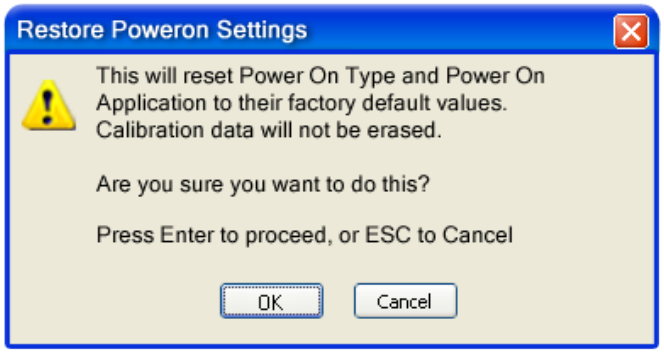


Key Path	System, Restore System Defaults
Example	:SYST:DEF INP
Initial S/W Revision	Prior to A.02.00

Restore Power On Defaults

This selection causes the Power On settings to be a reset to their default value. This level of Restore System Defaults does not affect any other system settings, mode settings and does not cause a mode switch. The Power On settings and their default values are Power On Type reset to Mode and Input/Output Defaults and Power On Application reset to whatever the factory set as its default value.

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



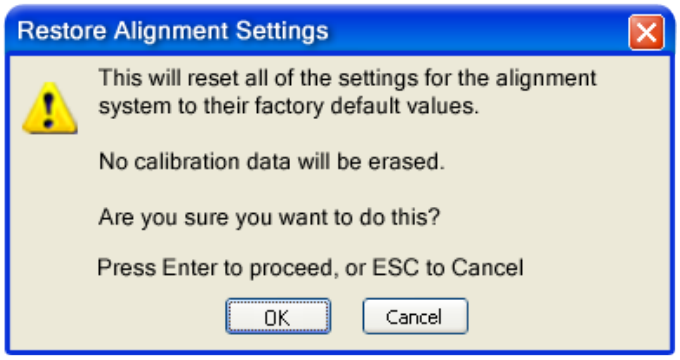
Key Path	System, Restore System Defaults
Example	:SYST:DEF PON
Initial S/W Revision	Prior to A.02.00

Restore Align Defaults

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

After performing this function, it may impact the auto-alignment time of the instrument until a new alignment baseline has been established.

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



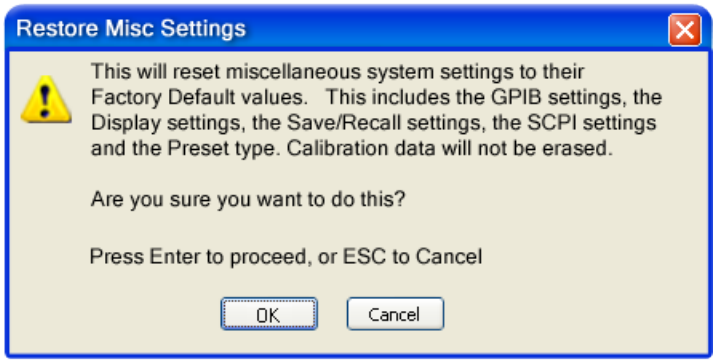
Key Path	System, Restore System Defaults
Example	:SYST:DEF ALIG
Initial S/W Revision	Prior to A.02.00

Restore Misc Defaults

This selection causes miscellaneous system settings to be reset to their default values. With this reset, you lose the GPIB address and it is reset to 18, so this should be used with caution. This level of Restore System Defaults does not affect any other system settings, mode settings and does not cause a mode switch. This miscellaneous group contains the rest of the settings that have not been part of the other Restore System Defaults groups. The following table is a complete list of settings associated with this group:

Miscellaneous Setting	Default Value
Verbose SCPI	Off
GPIB Address	18
Auto File Name Number	000
Save Type	State
State Save To	Register 1
Screen Save To	SCREEN000.png
DISP:ENABle	ON
Full Screen	Off
SCPI Telnet	ON
SCPI Socket	ON
SICL Server	ON
Display Intensity	100
Display Backlight	ON
Display Theme	TDColor
System Annotation	ON
The SYST:PRES:TYPE	MODE

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

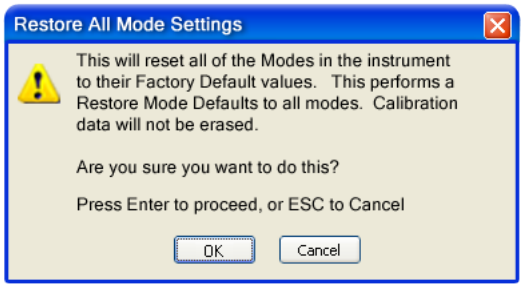


Key Path	System, Restore System Defaults
Example	:SYST:DEF MISC
Initial S/W Revision	Prior to A.02.00

Restore Mode Defaults (All Modes)

This selection resets all of the modes in the instrument back to their default state just as a Restore Mode Defaults does and it switches the instrument to the power-on mode and causes the default measurement for the power-on mode to be active. This level of Restore System Defaults does not affect any system settings, but it does affect the state of all modes and does cause a mode switch unless the instrument was already in the power-on mode.

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



.

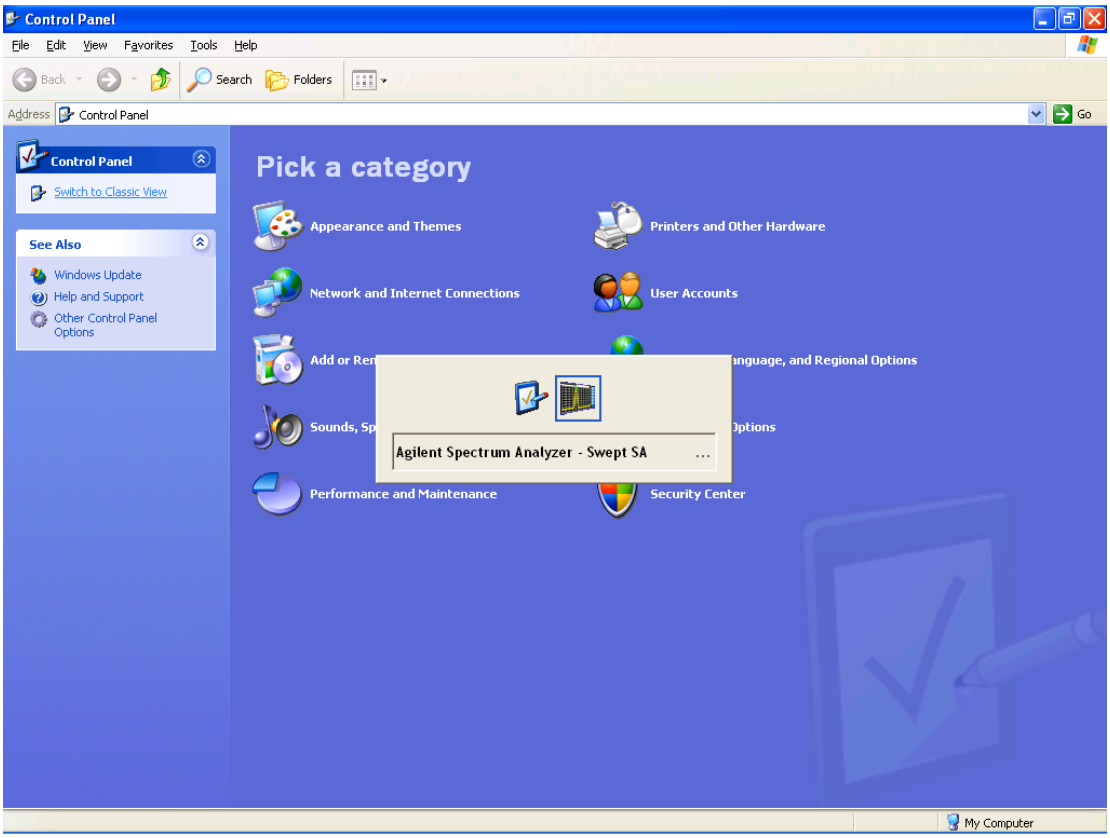
Key Path	System, Restore System Defaults
Example	:SYST:DEF MOD
Couplings	An All Mode will cause the currently running measurement to be aborted, mode switch to the power-on mode and activate the default measurement for the power-on mode.. It gets the mode to a consistent state with all of the default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

Control Panel...

Opens the Windows Control Panel. The Control Panel is used to configure certain elements of Windows that are not configured through the hardkey/softkey System menus.

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

Exit the Control Panel by clicking on the red X in the upper right hand corner, with a mouse



Or use Alt-Tab: press and hold the Alt 

key and press and release the Tab key until the Analyzer logo is showing in the window in the center of the screen, as above, then release the Alt key.

Key Path	System
Notes	No remote command for this key.
Initial S/W Revision	Prior to A.02.00

Licensing...

Opens the license explorer.

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

Key Path	System
Notes	No equivalent remote command for this key.
Backwards Compatibility Notes	In ESA the SCPI command for displaying the Show Licenses screen is: :SYSTem:CONFigure:LKEY:STATe OFF|ON|0|1:SYSTem:CONFigure:LKEY:STATe? There are no equivalent SCPI commands in the X-Series for displaying the License Explorer.
Initial S/W Revision	Prior to A.02.00

Remote Command `:SYSTem:LKEY <"OptionInfo">, <"LicenseInfo">`

Example SYST:LKEY "N9073A–1FP","027253AD27F83CDA5673A9BA5F427FDA5E4F25AEB1017638211AC9F60D9C639FE539735909C551DE0

Notes The <"OptionInfo"> contains the feature and the version. You must specify the feature but can omit the version. If you omit the version, the system regards it as the latest one, since the system knows which vers is supported for each feature.

The <"LicenseInfo"> contains the signature, the expiration date, and serial number for transport if transportable. You must specify the signature, but you can omit the other information. If you omit the expira date, the system regards it as permanent. If you omit the serial number, the system regards it as non-transportable. As a result, this supports reverse compatibility.

Initial S/W Revision Prior to A.02.00

Remote Command `:SYSTem:LKEY:DELete <"OptionInfo">,<"LicenseInfo">`

Example SYST:LKEY:DEL 'N9073A–1FP","027253AD27F83CDA5673A9BA5F427FDA5E4F25AEB1017638211AC9F60D9C639FE539735909C551DE0

Notes The <"OptionInfo"> contains the feature and the version. You must specify the feature but can omit the version. If you omit the version, the system regards it as the latest one, if more than one version is installed.

The <"LicenseInfo"> contains the signature, the expiration date, and whether or not be transportable. You m specify the signature, but you can omit the other information. If you omit the expiration date, the system reg it as permanent. If you omit the transportability, the system regards it as non-transportable. As a result, this supports reverse compatibility.

Initial Prior to A.02.00

S/W
Revision

Remote Command `:SYSTem:LKEY:LIST?`

Notes

Return Value:

An <arbitrary block data> of all the installed instrument licenses.

The format of each license is as follows.

<Feature>,<Version>,<Signature>,<Expiration Date>,<Serial Number for Transport>

Return Value Example:

#3136

N9073A–1FP,1.000,B043920A51CA

N9060A–2FP,1.000,4D1D1164BE64

N9020A–508,1.000,389BC042F920

N9073A–1F1,1.000,5D71E9BA814C,13-aug–2005

<arbitrary block data> is:

#NMMM<data>

Where:

N is the number of digits that describes the number of MMM characters. For example if the data was 55 bytes, N would be 2.

MMM would be the ASCII representation of the number of bytes. In the previous example, N would be 55.

<data> ASCII contents of the data

Initial S/W Revision: Prior to A.02.00

Remote Command `:SYSTem:LKEY? <"OptionInfo">`

Example SYST:LKEY? "N9073A–1FP"

Notes: The <"OptionInfo"> contains the feature and the version. You must specify the feature but can omit the version. If you omit the version, the system regards it as the latest one.

Return Value:

	<"LicenseInfo"> if the license is valid, null otherwise. <"LicenseInfo"> contains the signature, the expiration date, and serial number if transportable. Return Value Example: "B043920A51CA"
Initial S/W Revision	Prior to A.02.00

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

Security

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

Key Path	System
Initial S/W Revision	A.04.00

USB

The Windows operating system can be configured to disable write access to the USB ports for users who are in a secure environment where transferring data from the instrument is prohibited. This user interface is a convenient way for the customer to disable write access to USB.

Key Path	System, Security
Mode	All
Scope	Mode Global

Remote Command	`:SYSTem:SECurity:USB:WPRotect[:ENABle] ON|OFF|0|1` `:SYSTem:SECurity:USB:WPRotect[:ENABle]?`
Example	:SYST:SEC:USB:WPR ON Will set USB ports to Read-only
Notes	When the USB ports are in Read-only mode then no data can be stored to USB, including the internal USB memory used for a back-up location for the calibration data.
Dependencies	This key is grayed-out unless the current user has administrator privileges.
Preset	This is unaffected by Preset or any Restore System Defaults. An Agilent Recovery will set the USB to write protect OFF
State Saved	No
Range	Read-Write|Read only
Initial S/W Revision	A.04.00

Read-Write

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

Key Path	System, Security, USB
Example	:SYST:SEC:USB:WPR OFF Will set USB ports to Read-Write
Initial S/W Revision	A.04.00

Read only

Selection for disabling write access to the USB ports.

Key Path	System, Security, USB
Example	:SYST:SEC:USB:WPR ON Will set USB ports to Read only
Initial S/W Revision	A.04.00

RF Preselector

This menu provides the ability to switch to the particular filter in the Conducted or Radiated Band in order to see the frequency response of the specific RF Preselector filter. The Conducted band has 13 fixed filters and

Radiated band has 6 tunable filters and 1 fixed filter. The tunable filters will be characterized during the Factory Calibration test by executing the Characterize RF Preselector, All Bands button. Once after the filter is characterized, the amplitude correction for the RF Preselector path will be invalid and the receiver needs to go through the Factory Flatness calibration tests for the RF Preselector Path. The internal Calibrators for RF Preselector consists of DDS (Direct Digital Synthesizer) and Noise Source. The DDS operating range is from DC to 60 MHz whereas Noise Source is from 10 MHz to 4 GHz. Both the calibrators are used by the firmware to execute the RF Preselector System alignment to improve the amplitude variation of the RF Preselector path.

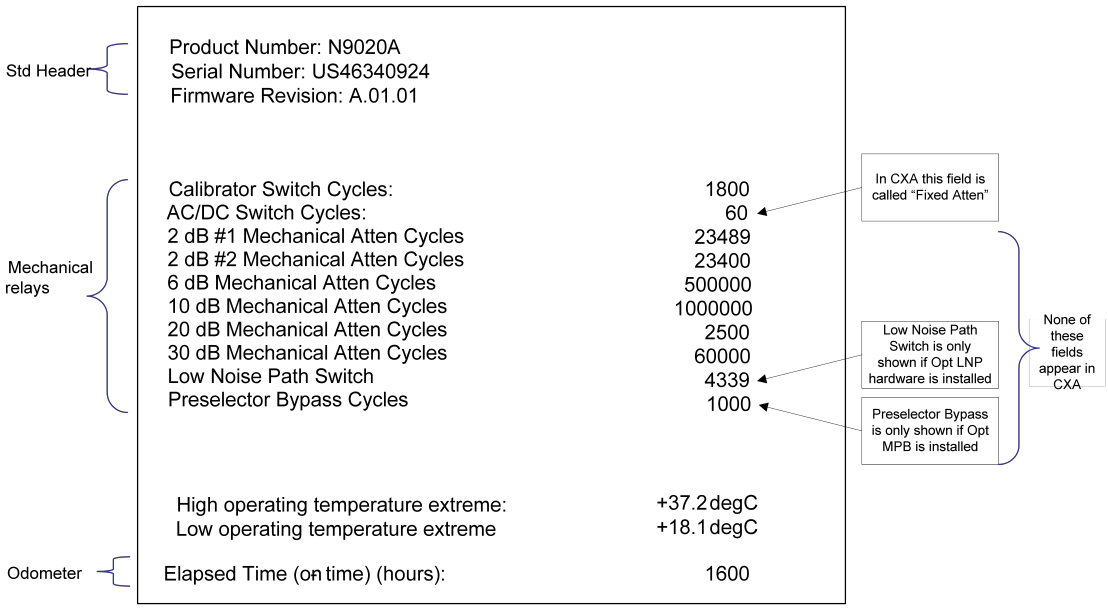
The Diagnostics key in the System menu gives you access to basic diagnostic capabilities of the instrument.

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

Show Hardware Statistics

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

The display should appear listing the statistics, product number, serial number, and firmware revision.



The data will be updated only when the Show Hardware Statistics menu key is pressed, it will not be updated while the screen is displayed.

The tabular data should be directly printable.

Key Path	System, Diagnostics
Mode	All
Notes	The values displayed on the screen are only updated upon entry to the screen and not updated while the screen is being displayed.
Initial S/W Revision	Prior to A.02.00

Service

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

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

Internet Explorer...

This key launches Microsoft Internet Explorer. A mouse and external keyboard are highly desired for using Internet Explorer. When Internet Explorer is running, close Internet Explorer to return focus to the Instrument Application (or use Alt-Tab).

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

Trace/Detector

This mode does not have Trace/Detector functionality.

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

Trigger

Accesses a menu of keys to control the selection of the trigger source and the setup of each of the trigger sources. The analyzer is designed to allow triggering from a number of different sources, for example, Free Run, Video, External, RF Burst, and so forth.

The TRIG:SOURCe command (below) will specify the trigger source for the currently selected input (RF or I/Q). If you change inputs, the new input remembers the trigger source it was last programmed to for the current measurement, and uses that trigger source. You can directly set the trigger source for each input using the TRIGger:RF:SOURce and TRIGger:IQ:SOURce commands (later in this section). When in External Mixing, the analyzer uses the RF trigger source.

Note the inclusion of the <measurement> parameter in the command below. Because each measurement remembers its own Trigger Source, the command must be qualified with the measurement name. Note that for the Swept SA measurement this is not the case; for backwards compatibility, no <measurement> parameter is used when setting the Trigger Source for the Swept SA measurement.

See "Trigger Source Presets" on page 4-313

See "RF Trigger Source" on page 4-316

See "I/Q Trigger Source" on page 4-317

See "More Information" on page 4-318

Key Path	Front-panel key

Remote Command	`:TRIGger:<measurement>[:SEQuence]:SOURce EXTernal1 | EXTernal2 | IMMediate | LINE | FRAMe | RFBurst | VIDeo | IF | ALARm | LAN | IQMag | IDEMod | QDEMod | IINPut | QINPut | AIQMag | TV`
	`:TRIGger:<measurement>[:SEQuence]:SOURce?`
	where <measurement> is the measurement for which you wish to set the Source (blank for the Swept SA measurement)

Example	TRIG:ACP:SOUR EXT1 Selects the external 1 trigger input for the ACP measurement and the selected input TRIG:SOUR VID

	Selects video triggering for the Swept SA (SANalyzer) measurement in the Spectrum Analyzer mode. For SAN, do not use the <measurement> keyword. Only send this form in the Spectrum Analyzer mode or you will get an Undefined Header error
Notes	Not all measurements have all the trigger sources available to them. Check the trigger source documentation for your specific measurement to see what sources are available. Not all trigger sources are available for each input. See the "RF Trigger Source" on page 4-316and "I/Q Trigger Source" on page 4-317 commands for detailed information on which trigger sources are available for each input. Other trigger-related commands are found in the INITiate and ABORt SCPI command subsystems. *OPC should be used after requesting data. This will hold off any subsequent changes to the selected trigger source, until after the sweep is completed and the data is returned. Available ranges and presets can vary from mode to mode.
Dependencies	In some models, there is no second External input. In these models, the External 2 key is blanked and the EXTernal2 parameter will generate a “Hardware missing; Not available for this model number” message.
Preset	See table below
Status Bits/OPC dependencies	The Status Operation Register bit 5 "Waiting for Trigger" is set at the same time as the Sweeping or Measuring bit is set. It is cleared when the trigger actually occurs (that is, after the trigger event occurs and all the applicable trigger criteria have been met). A corresponding pop-up message ("Waiting for trigger") is generated if no trigger signal appears after approximately 2 sec. This message goes away when a trigger signal appears.
Backwards Compatibility SCPI	`:TRIGger[:SEQuence]:SOURCe EXTernal` For backward compatibility, the parameter EXTernal is mapped to EXTernal1
Backwards Compatibility SCPI	`[:SENSe]:<measurement>:TRIGger:SOURce` This backwards compatibility alias command is provided for ESA/PSA compatibility This backwards compatibility command does not apply to the Swept SA measurement, for that just use :TRIGger:SOURCe This backwards compatibility command does not apply to the monitor spectrum, log plot and spot frequency measurements
Backwards Compatibility SCPI	`[:SENSe]:<measurement>:TRIGger:SOURce IF` In earlier instruments, the parameter IF was used by apps for the video trigger, so using the IF parameter selects VIDeo triggering. Sending IF in the command causes VID to be returned to a query.
Backwards Compatibility SCPI	`[:SENSe]:ACPR:TRIGger:SOURce` This backwards Compatibility SCPI command is provided to support the same functionality

	as [:SENSe]:ACPr:TRIGger:SOURce (PSA W-CDMA, PSA cdma2000 and PSA 1xEVDO) due to the fact that the ACPr node conflicts with the ACPower node.
Initial S/W Revision	Prior to A.02.00
Modified at S/W Revision	A.03.00

Trigger Source Presets

Here are the Trigger Source Presets for the various measurements:

Meas	Mode	Preset for RF	Preset for IQ	Notes
Swept SA	SA	IMM	IQ not supported	
CHP	SA, WCDMA, C2K, WIMAX OFDMA, 1xEVDO, DVB-T/H, DTMB, LTE, LTETDD, CMMB, ISDB-T, Digital Cable TV	IMM	IQ not supported	
OBW	SA, WCDMA, C2K, WIMAX OFDMA, TD-SCDMA, 1xEVDO, LTE, LTETDD, CMMB, ISDB-T	1xEVDO: EXT1 others: IMM	IQ not supported	For 1xEVDO mode, the trigger source is coupled with the gate state, as well as the gate source. When the trigger source changes to RFBurst, External1 or External2, the gate state is set to on, and the gate source is set identically with the trigger source. When the trigger source changes to IMMediate, VIDeo, LINE, FRAMe or IF, the gate state is set to off.
CCDF	SA, WCDMA, C2K, WIMAXOFDMA, TD-SCDMA, 1xEV-DO, DVB-T/H, DTMB, LTE, LTETDD, CMMB, ISDB-T, Digital Cable TV	WIMAXOFDMA: RFBurst LTETDD: BTS: External 1 MS: Periodic Timer TD-SCDMA and 1xEV-DO: BTS: External 1	TD-SCDMA and 1xEV-DO: BTS: External 1 MS: IQMag LTETDD: BTS: External 1	For TD-SCDMA: Trigger source is coupled with radio device. When radio device changes to BTS, trigger source will be changed to EXTernal1. When radio device changes to MS, trigger source will be set as RFBurst for RF or IQ Mag for BBIQ. When TriggerSource is RFBurst or IQ Mag, Measure Interval is grayed out.

		MS: RFBurst SA, WCDMA, C2K, LTE, CMMB, ISDB-T, DVB-T/H, DTMB, Digital Cable TV: IMMediate	MS: Periodic Timer Others: IMM	
ACP	SA, WCDMA, C2K, WIMAX OFDMA, TD-SCDMA, 1xEVDO, DVB-T/H, DTMB, LTE, LTETDD, CMMB, ISDB-T, Digital Cable TV	IMM	IQ not supported	
Tx Power	SA, GSM, TD-SCDMA	SA, GSM: RFBurst TD-SCDMA: EXTernal	IMM	TD-SCDMA doesn't support the Line and Periodic Timer parameters. When the mode is TD-SCDMA, if the Radio Device is switched to BTS, the value will be changed to External 1 and if the Radio device is switched to MS, the value will be changed to RFBurst
SPUR	SA, WCDMA, C2K, WIMAX OFDMA, TD-SCDMA,1xEV-DO, DVB-T/H, LTE, LTETDD	IMM	IQ not supported	
SEM	SA, WCDMA, C2K, WIMAX OFDMA, TD-SCDMA, 1xEVDO, DVB-T/H, DTMB, LTE, LTETDD, CMMB, ISDB-T, Digital Cable TV	1xEVDO(BTS): EXTernal1 All others: IMMediate	IQ not supported	
CDP	WCDMA	IMM	IMM	
RHO	WCDMA	IMM	IMM	

PCON	WCDMA	IMM	IMM	
QPSK	WCDMA, C2K, 1xEVDO	All except CDMA1xEVDO: IMMediate CDMA1xEVDO: EXT1	IMM	
MON	All except SA and BASIC	IMM	IQ not supported	
WAV		LTETDD: BTS: External 1 MS: Periodic Timer GSM/EDGE: RFBurst All others: IMMediate	LTETDD: BTS: External 1 MS: Periodic Timer GSM/EDGE: IQMag All others: IMMMediate	
PVT	WIMAXOFDMA	RFB	IMM	
EVM	WIMAXOFDMA, DVB-T/H, DTMB, LTE, LTETDD, CMMB, ISDB-T, Digital Cable TV	All but CMMB: IMM CMMB: Periodic Timer	All but CMMB: IMM CMMB: External 1	LTE, LTETDD supports Free Run, Video and External 1 only.
SPEC	BASIC	IMM	IMM	
LOG Plot	PN	IMM	IQ not supported	
Spot Freq	PN	IMM	IQ not supported	
GMSK PVT	EDGE/GSM	RFB	IMM	
GMSK PFER	EDGE/GSM	RFB	IQMag	
GMSK ORFS	EDGE/GSM	RF Burst	IQ not supported	
EDGE PVT	EDGE/GSM	RFB	IMM	
EDGE	EDGE/GSM	RFB	IQMag	

EVM			
EDGE ORFS	EDGE/GSM	Periodic Timer	IQ not supported
Combined WCDMA	WCDMA	IMM	IQ not supported
Combined GSM	EDGE/GSM	RFB	IQ not supported
List Power Step	WCDMA, EDGE/GSM	IMM	IQ not supported
Transmit On/Off Power	LTETDD	LTETDD: BTS: External 1 MS: Periodic Timer	LTETDD: BTS: External 1 MS: Periodic Timer
Transmit Analysis	BLUETOOTH	RFB	IQ not supported
Adjacent Channel Power	BLUETOOTH	IMM	IQ not supported
LE In-band Emissions	BLUETOOTH	IMM	IQ not supported
EDR In-band Spurious Emissions	BLUETOOTH	Periodic Timer	IQ not supported

RF Trigger Source

The RF Trigger Source command selects the trigger to be used for the specified measurement when RF is the selected input. The RF trigger source can be queried and changed even while another input is selected, but it is inactive until RF becomes the selected input.

Note the inclusion of the <measurement> parameter in the command below. Because each measurement remembers its own Trigger Source, the command

must be qualified with the measurement name. Note that for the Swept SA measurement this is not the case; for backwards compatibility, no <measurement> parameter is used when setting the Trigger Source for the Swept SA measurement.

Remote Command	`:TRIGger:<measurement>[:SEQuence]:RF:SOURce EXTernal1 | EXTernal2 | IMMediate | LINE | FRAMe | RFBurst | VIDeo | IF | ALARm | LAN | TV` `:TRIGger:<measurement>[:SEQuence]:RF:SOURce?`
Example	TRIG:ACP:RF:SOUR EXT1 Selects the external 1 trigger input for the ACP measurement and the RF input TRIG:RF:SOUR VID Selects video triggering for the SANalyzer measurement and the RF input. For SAN, do not use the <measurement> keyword.
Notes	Not all measurements have all the trigger sources available to them. Check the trigger source documentation for your specific measurement to see what sources are available. Not all trigger sources are available for each input. For the RF Trigger Source, the following trigger sources are available: *OPC should be used after requesting data. This will hold off any subsequent changes to the selected trigger source, until after the sweep is completed and the data is returned. Available ranges, and presets can vary from mode to mode.
Status Bits/OPC dependencies	The Status Operation Register bit 5 "Waiting for Trigger" is set at the same time as the Sweeping or Measuring bit is set. It is cleared when the trigger actually occurs (that is, after the trigger event occurs and all the applicable trigger criteria have been met). A corresponding pop-up message ("Waiting for trigger") is generated if no trigger signal appears after approximately 2 sec. This message goes away when a trigger signal appears.
Initial S/W Revision	Prior to A.02.00

I/Q Trigger Source

This command selects the trigger to be used for the specified measurement when I/Q (which requires option BBA) is the selected input. The I/Q trigger source can be queried and changed even while another input is selected, but it is inactive until I/Q becomes the selected input.

Remote Command	`:TRIGger:<measurement>[:SEQuence]:IQ:SOURce EXTernal1 | EXTernal2 | IMMediate | IQMag | IDEMod | QDEMod | IINPut | QINPut | AIQMag` `:TRIGger:<measurement>[:SEQuence]:IQ:SOURce?`
Example	TRIG:WAVeform:SOUR IQM Selects I/Q magnitude triggering for the IQ Waveform measurement and the I/Q input
Notes	Not all measurements have all the trigger sources available to them. Check the trigger source documentation for your specific measurement to see what sources are available. Not all trigger sources are available for each input. For the I/Q Trigger Source, the following trigger sources are available: *OPC should be used after requesting data. This will hold off any subsequent changes to the selected trigger source, until after the sweep is completed and the data is returned. Available ranges, and from mode to mode presets can vary
Status Bits/OPC dependencies	The Status Operation Register bit 5 "Waiting for Trigger" is set at the same time as the Sweeping or Measuring bit is set. It is cleared when the trigger actually occurs (that is, after the trigger event occurs and all the applicable trigger criteria have been met). A corresponding pop-up message ("Waiting for trigger") is generated if no trigger signal appears after approximately 2 sec. This message goes away when a trigger signal appears.
Initial S/W Revision	Prior to A.02.00

More Information

The trigger menus let you select the trigger source and trigger settings for a sweep or measurement. In triggered operation (basically, any trigger source other than Free Run), the analyzer will begin a sweep or measurement only with the selected trigger conditions are met, generally when your trigger source signal meets the specified trigger level and polarity requirements. (In FFT measurements, the trigger controls when the data acquisition begins for FFT conversion.)

For each of the trigger sources, you may define a set of operational parameters or settings which will be applied when that source is selected as the current trigger source. Examples of these settings are Trigger Level, Trigger Delay, and Trigger Slope. You may apply different settings for each source; so, for example, you could have a Trigger Level of 1v for External 1 trigger and –10 dBm for Video trigger.

Once you have established the settings for a given trigger source, they generally will remain unchanged for that trigger source as you go from measurement to measurement within a Mode (although the settings do change as you go from Mode to Mode). Furthermore, the trigger settings within a Mode are the same for the Trigger menu, the Gate Source menu, and the Sync Source menu that is part of the Periodic Timer Trigger Setup menu. That is, if Ext1 trigger level is set to 1v in the Trigger menu, it will appear as 1v in both the Gate Source and the Sync Source menus. For these reasons the trigger settings commands are not qualified with the measurement name, the way the trigger source commands are.

The settings setup menu can be accessed by pressing the key for the current trigger source a second time. For example, one press of Video selects the Video trigger as the source. The Video key becomes highlighted and the hollow arrow on the key turns black. Now a second press of the key takes you into the Video Trigger Setup menu.

Trigger Setup Parameters:

The following examples show trigger setup parameters using an external trigger source.

Example 1 illustrates the trigger conditions with negative slope and no trigger occurs during trigger Holdoff time.

Example 2 illustrates the trigger conditions with positive slope, trigger delay, and auto trigger time.

Free Run

Pressing this key, when it is not selected, selects free-run triggering. Free run triggering occurs immediately after the sweep/measurement is initiated.

Key Path	Trigger	
Example	TRIG:SOUR IMM	Swept SA measurement
	TRIG:<meas>:SOUR IMM	Measurements other than Swept SA
State Saved	Saved in instrument state	
Status Bits/OPC dependencies	The Status Operation Register bit 5 "Waiting for Trigger" is set at the same time as the	

	Sweeping or Measuring bit is set. It is cleared when the trigger actually occurs (that is, after the trigger event occurs and all the applicable trigger criteria have been met). A corresponding pop-up message ("Waiting for trigger") is generated if no trigger signal appears after approximately 2 sec. This message goes away when a trigger signal appears.
Initial S/W Revision	Prior to A.02.00

Video (IF Envelope)

Pressing this key, when it is not selected, selects the video signal as the trigger. The Video trigger condition is met when the video signal (the filtered and detected version of the input signal, including both RBW and VBW filtering) crosses the video trigger level.

NOTE When the detector selected for all active traces is the average detector, the video signal for triggering does not include any VBW filtering.

The video trigger level is shown as a labeled line on the display. The line is displayed as long as video is the selected trigger source.

Pressing this key, when it is already selected, accesses the video trigger setup functions.

Key Path	Trigger	
Example	TRIG:SOUR VID	Swept SA measurement
	TRIG:<meas>:SOUR VID	Measurements other than Swept SA
Notes	Log Plot and Spot Frequency measurements do not support Video Trigger	
Dependencies	Video trigger is allowed in average detector mode.	
State Saved	Saved in instrument state	
Status Bits/OPC dependencies	The Status Operation Register bit 5 "Waiting for Trigger" is set at the same time as the Sweeping or Measuring bit is set. It is cleared when the trigger actually occurs (that is, after the trigger event occurs and all the applicable trigger criteria have been met). A corresponding pop-up message ("Waiting for trigger") is generated if no trigger signal appears after approximately 2 sec. This message goes away when a trigger signal appears.	

Backwards Compatibility Notes	
Initial S/W Revision	Prior to A.02.00

Trigger Level

Sets a level for the video signal trigger. When the video signal crosses this level, with the chosen slope, the trigger occurs. This level is displayed with a horizontal line only if Video is the selected trigger source.

Key Path	Trigger, Video
Remote Command	`:TRIGger[:SEQuence]:VIDeo:LEVel <ampl>` `:TRIGger[:SEQuence]:VIDeo:LEVel?`
Example	TRIG:VID:LEV –40 dBm
Notes	When sweep type = FFT, the video trigger uses the amplitude envelope in a bandwidth wider than the FFT width as a trigger source. This might often be useful, but does not have the same relationship between the displayed trace and the trigger level as in swept triggering. Amplitude Corrections are not taken into account by the Video Trig Level. For example, if you have given yourself effective gain with an amplitude correction factor, the Video Trigger will not fire until you have dropped the trigger line that far below the displayed signal level, rather than simply dropping it down to the displayed signal level. Note that other corrections, specifically External Gain and Ref Level Offset, modify the actual trace data as it is taken and therefore ARE taken into account by Trig Level.
Couplings	This same level is used for the Video trigger source in the Trigger menu and for the Video selection in the Gate Source menu.
Preset	Set the Video Trigger Level –25 dBm on Preset. When the Video Trigger Level becomes the active function, if the value is off screen, set it to either the top or bottom of screen, depending on which direction off screen it was.
State Saved	Saved in instrument state
Min	–170 dBm
Max	+30 dBm
Default Unit	depends on the current selected Y axis unit

Backwards Compatibility SCPI	`:TRIGger[:SEQuence]:IF:LEVel` `:TRIGger[:SEQuence]:IF:LEVel?`
Backwards Compatibility Notes	This alias is provided for backward compatibility with VSA/PSA comms apps.
Initial S/W Revision	Prior to A.02.00

Trig Slope

Controls the trigger polarity. It is set positive to trigger on a rising edge and negative to trigger on a falling edge.

Key Path	Trigger, Video
Remote Command	`:TRIGger[:SEQuence]:VIDeo:SLOPe POSitive|NEGative` `:TRIGger[:SEQuence]:VIDeo:SLOPe?`
Example	TRIG:VID:SLOP NEG
Preset	POSitive
State Saved	Saved in instrument state

Backwards Compatibility SCPI	`:TRIGger[:SEQuence]:IF:SLOPe NEGative|POSitive`
	`:TRIGger[:SEQuence]:IF:SLOPe?`
	For backward compatibility with VSA/PSA comms apps

Backwards Compatibility Notes	The legacy :TRIGger[:SEQuence]:SLOPe command affects the slopes for the VID, LINE, EXT1, EXT2, and RFB triggers.
Initial S/W Revision	Prior to A.02.00

Remote Command	`:TRIGger[:SEQuence]:SLOPe POSitive|NEGative` `:TRIGger[:SEQuence]:SLOPe?`
Example	TRIG:SLOP NEG
Preset	POSitive
State Saved	Saved in instrument state
Backwards	In ESA/PSA, the Trigger Slope was global to all triggers. In the X-Series, the slope can be

Compatibility Notes	set individually for each Trigger Source. For backward compatibility, the global SLOPe command updates all instances of trigger slope (VID, LINE, EXT1, EXT2, TV, RFB). The query returns the trigger slope setting of the currently selected trigger source.
Initial S/W Revision	Prior to A.02.00

Trig Delay

Controls a time delay during that the analyzer will wait to begin a sweep after meeting the trigger criteria. You can use negative delay to pre-trigger the instrument in the time domain or FFT, but not in swept spans.

Key Path	Trigger, Video

Remote Command	`:TRIGger[:SEQuence]:VIDeo:DELay <time>`
	`:TRIGger[:SEQuence]:VIDeo:DELay?`
	`:TRIGger[:SEQuence]:VIDeo:DELay:STATe OFF|ON|0|1`
	`:TRIGger[:SEQuence]:VIDeo:DELay:STATe?`

Example	TRIG:VID:DEL:STAT ON TRIG:VID:DEL 100 ms
Notes	Video trigger delay may be set to negative values, in time domain, FFT and even swept. It makes intuitive sense in time domain and works well in FFT mode where the bandwidth of the filter before the video trigger is about 1.25 span. In swept spans, negative settings of Trig Delay are treated as a zero setting within the internal hardware and the advisory message "Neg. Trig Delay unavailable in Swept Mode, zero delay used." is generated when such a delay is set.
Preset	Off, 1 us
State Saved	Saved in instrument state
Min	–150 ms
Max	+500 ms
Default Unit	s

Backwards Compatibility SCPI	`:TRIGger[:SEQuence]:IF:DELay`
	`:TRIGger[:SEQuence]:DELay`
	For backward compatibility with VSA/PSA comms apps

Initial S/W Revision	Prior to A.02.00

Remote Command
```
:TRIGger[:SEQuence]:DELay <time>
:TRIGger[:SEQuence]:DELay?
:TRIGger[:SEQuence]:DELay:STATe OFF|ON|0|1
:TRIGger[:SEQuence]:DELay:STATe?
```

Example TRIG:DEL 1 ms

Preset 1 us

State Saved Saved in instrument state

Backwards Compatibility Notes In ESA/PSA, the Trigger Delay was global to all triggers. In the X-Series, the delay can be set individually for each Trigger Source. For backward compatibility, the global DELay command updates all instances of trigger slope (VID, LINE, EXT1, EXT2) except TV and RFBurst. The query returns the trigger delay setting of the currently selected trigger source.

Initial S/W Revision Prior to A.02.00

Remote Command
```
:TRIGger[:SEQuence]:OFFSet <time>
:TRIGger[:SEQuence]:OFFSet?
:TRIGger[:SEQuence]:OFFSet:STATe OFF|ON|0|1
:TRIGger[:SEQuence]:OFFSet:STATe?
```

Example TRIG:OFFS ON

TRIG:OFFS –100 ms

Notes These are ESA commands for trigger offset that allowed you to use a positive or negative delay when in zero span and in a Res BW >= 1 kHz. For ESA compatibility, X-series analyzers keep track of this offset and adds it to the Trigger Delay for VIDeo, LINE, EXTernal1 or EXTernal2 whenever the value is sent to the hardware, if in Zero Span and RBW >= 1 kHz.

Preset Off, 0 s

State Saved Saved in instrument state

Min –11 s

Max +11 s

Initial S/W Revision Prior to A.02.00

Line

Pressing this key, when it is not selected, selects the line signal as the trigger. A new sweep/measurement will start synchronized with the next cycle of the line voltage. Pressing this key, when it is already selected, access the line trigger setup menu.

Key Path	Trigger
Example	TRIG:SOUR LINE Swept SA measurement
	TRIG:<meas>:SOUR LINE Measurements other than Swept SA
Dependencies	Line trigger is not available when operating from a "dc power source", for example, when the instrument is powered from batteries.
State Saved	Saved in instrument state
Status Bits/OPC dependencies	The Status Operation Register bit 5 "Waiting for Trigger" is set at the same time as the Sweeping or Measuring bit is set. It is cleared when the trigger actually occurs (that is, after the trigger event occurs and all the applicable trigger criteria have been met). A corresponding pop-up message ("Waiting for trigger") is generated if no trigger signal appears after approximately 2 sec. This message goes away when a trigger signal appears.
Initial S/W Revision	Prior to A.02.00

Trig Slope

Controls the trigger polarity. It is set positive to trigger on a rising edge and negative to trigger on a falling edge.

Key Path	Trigger, Line
Remote Command	`:TRIGger[:SEQuence]:LINE:SLOPe POSitive|NEGative`
	`:TRIGger[:SEQuence]:LINE:SLOPe?`
Example	TRIG:LINE:SLOP NEG
Preset	POSitive
State Saved	Saved in instrument state
Backwards Compatibility Notes	The legacy :TRIGger[:SEQuence]:SLOPe command affects the slopes for the VID, LINE, EXT1, EXT2, and RFB triggers.
Initial S/W Revision	Prior to A.02.00

Trig Delay

Controls a time delay during which the analyzer will wait to begin a sweep after meeting the trigger criteria. You can use negative delay to pre-trigger the instrument in time domain or FFT, but not in swept spans.

Key Path	Trigger, Line
Remote Command	`:TRIGger[:SEQuence]:LINE:DELay <time>`
	`:TRIGger[:SEQuence]:LINE:DELay?`
	`:TRIGger[:SEQuence]:LINE:DELay:STATe OFF|ON|0|1`
	`:TRIGger[:SEQuence]:LINE:DELay:STATe?`
Example	TRIG:LINE:DEL:STAT ON
	TRIG:LINE:DEL 100 ms
Notes	Video trigger delay may be set to negative values, in time domain, FFT and even swept. It makes intuitive sense in time domain and works well in FFT mode where the bandwidth of the filter before the video trigger is about 1.25 span. In swept spans, negative settings of Trig Delay are treated as a zero setting within the internal hardware and the advisory message "Neg. Trig Delay unavailable in Swept Mode, zero delay used." is generated when such a delay is set.
Preset	Off, 1.000 us
State Saved	Saved in instrument state
Min	–150 ms
Max	500 ms
Default Unit	S
Backwards Compatibility Notes	The legacy :TRIGger[:SEQuence]:DELay command affects the delay for the VID, LINE, EXT1, and EXT2 triggers.
	The legacy :TRIGger[:SEQuence]:OFFSet command is supported for the VIDeo, LINE, EXT1, and EXT2 triggers.
Initial S/W Revision	Prior to A.02.00

External 1

Pressing this key, when it is not selected, selects an external input signal as the trigger. A new sweep/measurement will start when the external trigger condition is met using the external 1 input connector on the rear panel.

Pressing this key, when it is already selected, accesses the external 1 trigger setup menu.

Key Path	Trigger	
Example	TRIG:SOUR EXT1	Swept SA measurement
	TRIG:<meas>:SOUR EXT1	Measurements other than Swept SA
Dependencies	Grayed out if in use by Point Trigger in the Source Setup menu.	
	Forced to Free Run if already selected and Point Trigger is set to External 1.	
State Saved	Saved in instrument state	
Status Bits/OPC dependencies	The Status Operation Register bit 5 "Waiting for Trigger" is set at the same time as the Sweeping or Measuring bit is set. It is cleared when the trigger actually occurs (that is, after the trigger event occurs and all the applicable trigger criteria have been met). A corresponding pop-up message ("Waiting for trigger") is generated if no trigger signal appears after approximately 2 sec. This message goes away when a trigger signal appears.	
Initial S/W Revision	Prior to A.02.00	

Trigger Level

Sets the value where the external 1 trigger input will trigger a new sweep/measurement.

Key Path	Trigger, External 1
Remote Command	`:TRIGger[:SEQuence]:EXTernal1:LEVel <level>`
	`:TRIGger[:SEQuence]:EXTernal1:LEVel?`
Example	TRIG:EXT1:LEV 0.4 V
Couplings	This same level is used for the Ext1 trigger source in the Trigger menu, for the Ext1 selection in the Periodic Timer sync source (in the Trigger menu and in the Gate Source menu), and also for the Ext1 selection in the Gate Source menu.
Preset	1.2 V
State Saved	Saved in instrument state
Min	–5 V
Max	5 V
Default Unit	V
Backwards Compatibility	`:TRIGger[:SEQuence]:EXTernal:LEVel`
	For backward compatibility, the parameter EXTernal is mapped to EXTernal1

SCPI	
Backwards Compatibility SCPI	`:TRIGger[:SEQuence]:FRAMe:EXTernal1:LEVel`
Initial S/W Revision	Prior to A.02.00

Trig Slope

Controls the trigger polarity. It is set positive to trigger on a rising edge and negative to trigger on a falling edge.

Key Path	Trigger, External 1
Remote Command	`:TRIGger[:SEQuence]:EXTernal1:SLOPe POSitive|NEGative`
	`:TRIGger[:SEQuence]:EXTernal1:SLOPe?`
Example	TRIG:EXT1:SLOP NEG
Couplings	This same slope is used in the Ext1 selection for the trigger source in the Trigger menu and for the period timer sync source (in the Trigger menu and in the Gate Source menu).
Preset	POSitive
State Saved	Saved in instrument state
Backwards Compatibility SCPI	`:TRIGger[:SEQuence]:EXTernal:SLOPe`
	For backward compatibility, the parameter EXTernal is mapped to EXTernal1
Backwards Compatibility SCPI	`:TRIGger[:SEQuence]:FRAMe:EXTernal1:SLOPe`
Backwards Compatibility Notes	The legacy :TRIGger[:SEQuence]:SLOPe command affects the slopes for the VID, LINE, EXT1, EXT2, and RFB triggers.
Initial S/W Revision	Prior to A.02.00

Trig Delay

Controls a time delay during which the analyzer will wait to begin a sweep after meeting the trigger criteria. You can use negative delay to pre-trigger the

instrument in time domain or FFT, but not in swept spans.

Key Path	Trigger, External 1
Remote Command	`:TRIGger[:SEQuence]:EXTernal1:DELay <time>`
	`:TRIGger[:SEQuence]:EXTernal1:DELay?`
	`:TRIGger[:SEQuence]:EXTernal1:DELay:STATe OFF|ON|0|1`
	`:TRIGger[:SEQuence]:EXTernal1:DELay:STATe?`
Example	TRIG:EXT1:DEL:STAT ON
	TRIG:EXT1:DEL 100 ms
Notes	Video trigger delay may be set to negative values, in time domain, FFT and even swept. It makes intuitive sense in time domain and works well in FFT mode where the bandwidth of the filter before the video trigger is about 1.25 span. In swept spans, negative settings of Trig Delay are treated as a zero setting within the internal hardware and the advisory message "Neg. Trig Delay unavailable in Swept Mode, zero delay used." is generated when such a delay is set.
Preset	Off, 1.000 us
State Saved	Saved in instrument state
Min	–150 ms
Max	+500 ms
Default Unit	s
Backwards Compatibility SCPI	`:TRIGger[:SEQuence]:EXTernal:DELay`
	For backward compatibility, the parameter EXTernal is mapped to EXTernal1
Backwards Compatibility Notes	The legacy :TRIGger[:SEQuence]:DELay command affects the delay for the VID, LINE, EXT1, and EXT2 triggers.
	The legacy :TRIGger[:SEQuence]:OFFSet command is supported for the VIDeo, LINE, EXT1, and EXT2 triggers.
Initial S/W Revision	Prior to A.02.00

External 2

Pressing this key, when it is not selected, selects an external input signal as the trigger. A new sweep/measurement will start when the external trigger condition is met using the external 2 input connector. The external trigger 2 input connector is on the rear panel.

Pressing this key, when it is already selected, accesses the external 2 trigger setup menu.

Key Path	Trigger
Example	TRIG:SOUR EXT2 Swept SA measurement TRIG:<meas>:SOUR EXT2 Measurements other than Swept SA
Dependencies	In some models, there is no second External input. In these models, the External 2 key is blanked and the EXTernal2 parameter will generate a "Hardware missing; Not available for this model number" message. Grayed out if in use by Point Trigger in the Source Setup menu. Forced to Free Run if already selected and Point Trigger is set to External 2.
State Saved	Saved in instrument state
Status Bits/OPC dependencies	The Status Operation Register bit 5 "Waiting for Trigger" is set at the same time as the Sweeping or Measuring bit is set. It is cleared when the trigger actually occurs (that is, after the trigger event occurs and all the applicable trigger criteria have been met). A corresponding pop-up message ("Waiting for trigger") is generated if no trigger signal appears after approximately 2 sec. This message goes away when a trigger signal appears.
Initial S/W Revision	Prior to A.02.00
Modified at S/W Revision	A.03.00

Trigger Level

Sets the value where the external 2 trigger input will trigger a new sweep/measurement.

Key Path	Trigger, External 2
Remote Command	`:TRIGger[:SEQuence]:EXTernal2:LEVel` `:TRIGger[:SEQuence]:EXTernal2:LEVel?`
Example	TRIG:EXT2:LEV 1.1 V
Couplings	This same level is used for the Ext2 trigger source in the Trigger menu, for the Ext2 selection in the Periodic Timer sync source (in the Trigger menu and in the Gate Source menu), and also for the Ext2 selection in the Gate Source menu.
Preset	1.2 V
State Saved	Saved in instrument state

Min	–5 V
Max	5 V
Default Unit	V
Backwards Compatibility SCPI	`:TRIGger[:SEQuence]:FRAMe:EXTernal2:LEVel`
Initial S/W Revision	Prior to A.02.00

Trig Slope

Controls the trigger polarity. It is set positive to trigger on a rising edge and negative to trigger on a falling edge.

Key Path	Trigger, External 2
Remote Command	`:TRIGger[:SEQuence]:EXTernal2:SLOPe POSitive|NEGative` `:TRIGger[:SEQuence]:EXTernal2:SLOPe?`
Example	TRIG:EXT2:SLOP NEG
Couplings	This same slope is used in the Ext2 selection for the trigger source in the Trigger menu and for the period timer sync source (in the Trigger menu and in the Gate Source menu).
Preset	POSitive
State Saved	Saved in instrument state
Backwards Compatibility SCPI	`:TRIGger[:SEQuence]:FRAMe:EXTernal2:SLOPe`
Backwards Compatibility Notes	The legacy :TRIGger[:SEQuence]:SLOPe command affects the slopes for the VID, LINE, EXT1, EXT2, and RFB triggers.
Initial S/W Revision	Prior to A.02.00

Trig Delay

Controls a time delay during which the analyzer will wait to begin a sweep after meeting the trigger criteria. You can use negative delay to pre-trigger the instrument in time domain or FFT, but not in swept spans.

Key Path	Trigger, External 2
Remote Command	`:TRIGger[:SEQuence]:EXTernal2:DELay <time>`
	`:TRIGger[:SEQuence]:EXTernal2:DELay?`
	`:TRIGger[:SEQuence]:EXTernal2:DELay:STATe OFF|ON|0|1`
	`:TRIGger[:SEQuence]:EXTernal2:DELay:STATe?`
Example	TRIG:EXT2:DEL:STAT ON
	TRIG:EXT2:DEL 100 ms
Notes	Video trigger delay may be set to negative values, in time domain, FFT and even swept. It makes intuitive sense in time domain and works well in FFT mode where the bandwidth of the filter before the video trigger is about 1.25 span. In swept spans, negative settings of Trig Delay are treated as a zero setting within the internal hardware and the advisory message "Neg. Trig Delay unavailable in Swept Mode, zero delay used." is generated when such a delay is set.
Preset	Off, 1.000 us
State Saved	Saved in instrument state
Min	–150 ms
Max	500 ms
Default Unit	s
Backwards Compatibility Notes	The legacy :TRIGger[:SEQuence]:DELay command affects the delay for the VID, LINE, EXT1, and EXT2 triggers.
	The legacy :TRIGger[:SEQuence]:OFFSet command is supported for the VIDeo, LINE, EXT1, and EXT2 triggers.
Initial S/W Revision	Prior to A.02.00

RF Burst

Pressing this key, when it is not selected, selects the RF Burst as the trigger. A new sweep/measurement will start when an RF burst envelope signal is identified from the signal at the RF Input connector. Pressing this key, when it is already selected, accesses the RF Burst trigger setup menu.

In some models, a variety of burst trigger circuitry is available, resulting in various available burst trigger bandwidths. The analyzer automatically chooses the appropriate trigger path based on the hardware configuration and other settings of the analyzer.

Key Path	Trigger
Example	TRIG:SOUR RFB Swept SA measurement
	TRIG:<meas>:SOUR RFB Measurements other than Swept SA
State Saved	Saved in instrument state
Status Bits/OPC dependencies	The Status Operation Register bit 5 "Waiting for Trigger" is set at the same time as the Sweeping or Measuring bit is set. It is cleared when the trigger actually occurs (that is, after the trigger event occurs and all the applicable trigger criteria have been met). A corresponding pop-up message ("Waiting for trigger") is generated if no trigger signal appears after approximately 2 sec. This message goes away when a trigger signal appears.
Backwards Compatibility Notes	
Initial S/W Revision	Prior to A.02.00
Modified at S/W Revision	A.04.00

Absolute Trigger Level

Sets the absolute trigger level for the RF burst envelope.

When using the External Mixing path, the Absolute Trigger Level is uncalibrated because the factory default was set to accommodate the expected IF levels for the RF path.

Key Path	Trigger, RF Burst
Scope	Meas Global
Remote Command	`:TRIGger[:SEQuence]:RFBurst:LEVel:ABSolute <ampl>`
	`:TRIGger[:SEQuence]:RFBurst:LEVel:ABSolute?`
Example	TRIG:RFB:LEV:ABS 10 dBm
	sets the trigger level of the RF burst envelope signal to the absolute level of 10 dBm
Notes	Sending this command does not switch the setting from relative to absolute; to switch it you need to send the :TRIGger[:SEQuence]:RFBurst:LEVel:TYPE command, below.

	Amplitude Corrections are not taken into account by the Absolute Trigger Level. For example, if you have given yourself effective gain with an amplitude correction factor, the Absolute Trigger will not fire until you have set the trigger level that far below the displayed signal level, rather than simply to the displayed signal level. This is only true for Amplitude Corrections, not External Gain or Ref Level Offset functions. If mode is Bluetooth, the default value is –50 dBm.
Couplings	This same level is used for the RF Burst trigger source in the Trigger menu, for the RF Burst selection in the Periodic Timer sync source (in the Trigger menu and in the Gate Source menu), and also for the RF Burst selection in the Gate Source menu
Preset	–20 dBm
State Saved	Saved in state
Min	–200 dBm
Max	100 dBm
Default Unit	depends on the current selected Y-Axis unit
Backwards Compatibility SCPI	`:TRIGger[:SEQuence]:FRAMe:RFBurst:LEVel:ABSolute`
Initial S/W Revision	Prior to A.02.00
Modified at S/W Revision	A.04.00

Key Path	Trigger, RF Burst
Remote Command	`:TRIGger[:SEQuence]:RFBurst:LEVel:TYPE ABSolute|RELative` `:TRIGger[:SEQuence]:RFBurst:LEVel:TYPE?`
Example	TRIG:RFB:LEV:TYPE REL sets the trigger level type of the RF burst trigger to Relative.
Preset	ABSolute
State Saved	Saved in instrument state
Initial S/W Revision	Prior to A.02.00
Modified at S/W Revision	A.04.00

Relative Trigger Level

Sets the relative trigger level for the RF burst envelope.

In some models, the relative burst trigger function is implemented in hardware. In other models, without the advanced triggering hardware required, the relative burst trigger function is implemented in software in some measurements, and is unavailable in other measurements.

When implemented in software, the relative RF Burst trigger function is implemented as follows:

1. The measurement starts with the absolute RF Burst trigger setting. If it cannot get a trigger with that level, auto trigger fires and the acquisition starts anyway. After the acquisition, the measurement searches for the peak in the acquired waveform and saves it.

2. Now, in the next cycle of the measurement, the measurement determines a new absolute RF Burst level based on the peak value from the first measurement and the Relative RF Burst Trigger Level (always 0 or negative dB) set by the user. The following formula is used:

absolute RF Burst level = peak level of the previous acquisition + relative RF Burst level

3. If the new absolute RF Burst level differs from the previous by more than 0.5 dB, the new level is sent to the hardware; otherwise it is not updated (to avoid slowing down the acquisition)

Steps 2 and 3 repeat for subsequent measurements.

Key Path	Trigger, RF Burst
Scope	Meas Global
Remote Command	`:TRIGger[:SEQuence]:RFBurst:LEVel:RELative <rel_ampl>`
	`:TRIGger[:SEQuence]:RFBurst:LEVel:RELative?`
Example	TRIG:RFB:LEV:REL –10 dB
	sets the trigger level of the RF burst envelope signal to the relative level of –10 dB
Notes	Sending this command does not switch the setting from absolute to relative; to switch it you need to send the :TRIGger[:SEQuence]:RFBurst:LEVel:TYPE command, above.
	The relative trigger level is not available in some measurements. In those measurements the RELative parameter, and the :TRIGger[:SEQuence]:RFBurst:LEVel:TYPE command (above), will generate an error if sent.
Dependencies	This key is grayed out and Absolute Trigger Level selected if the required hardware is not present in your analyzer and the current measurement does not support Relative

	triggering.
Preset	–6 dB GSM: –25 dB
State Saved	Saved in instrument state
Min	–45 dB
Max	0 dB
Default Unit	dB or dBc
Backwards Compatibility SCPI	`:TRIGger[:SEQuence]:RFBurst:LEVel`
	This legacy command is aliased to :TRIGger[:SEQuence]:RFBurst:LEVel:RELative because the PSA had ONLY relative burst triggering
Initial S/W Revision	Prior to A.02.00
Modified at S/W Revision	A.04.00

Trigger Slope

It is set positive to trigger on a rising edge and negative to trigger on a falling edge.

Key Path	Trigger, RF Burst
Remote Command	`:TRIGger[:SEQuence]:RFBurst:SLOPe POSitive|NEGative` `:TRIGger[:SEQuence]:RFBurst:SLOPe?`
Example	TRIG:RFB:SLOP NEG
Couplings	This same slope is used in the RF Burst selection for the trigger source in the Trigger menu and for the period timer sync source (in the Trigger menu and in the Gate Source menu).
Preset	POSitive
State Saved	Saved in instrument state
Backwards Compatibility SCPI	`:TRIGger[:SEQuence]:FRAMe:RFBurst:SLOPe`

Backwards Compatibility Notes	The legacy :TRIGger[:SEQuence]:SLOPe command affects the slopes for the VID, LINE, EXT1, EXT2, and RFB triggers.
Initial S/W Revision	Prior to A.02.00

Trig Delay

Controls a time delay during which the analyzer will wait to begin a sweep after meeting the trigger criteria. You can use negative delay to pre-trigger the instrument in time domain or FFT, but not in swept spans.

Key Path	Trigger, RF Burst

Remote Command	`:TRIGger[:SEQuence]:RFBurst:DELay <time>`
	`:TRIGger[:SEQuence]:RFBurst:DELay?`
	`:TRIGger[:SEQuence]:RFBurst:DELay:STATe OFF|ON|0|1`
	`:TRIGger[:SEQuence]:RFBurst:DELay:STATe?`

Example	TRIG:RFB:DEL:STAT ON TRIG:RFB:DEL 100 ms
Notes	Video trigger delay may be set to negative values, in time domain, FFT and even swept. It makes intuitive sense in time domain and works well in FFT mode where the bandwidth of the filter before the video trigger is about 1.25 span. In swept spans, negative settings of Trig Delay are treated as a zero setting within the internal hardware and the advisory message "Neg. Trig Delay unavailable in Swept Mode, zero delay used." is generated when such a delay is set.
Preset	Off, 1.000 us
State Saved	Saved in instrument state
Min	–150 ms
Max	500 ms
Default Unit	s
Initial S/W Revision	Prior to A.02.00

Periodic Timer (Frame Trigger)

Pressing this key, when it is not selected, selects the internal periodic timer signal as the trigger. Triggering occurrences are set by the Period parameter, which is modified by the Sync Source and Offset. Pressing this key, when it is already selected, accesses the periodic timer trigger setup functions.

If you do not have a sync source selected (it is Off), then the internal timer will not be synchronized with any external timing events.

Key Path	Trigger	
Example	TRIG:SOUR FRAM	Swept SA measurement
	TRIG:<meas>:SOUR FRAM	Measurements other than Swept SA
State Saved	Saved in instrument state	
Readback	[Sync: <value of Sync Source>], for example, [Sync: External 1]	
Status Bits/OPC dependencies	The Status Operation Register bit 5 "Waiting for Trigger" is set at the same time as the Sweeping or Measuring bit is set. It is cleared when the trigger actually occurs (that is, after the trigger event occurs and all the applicable trigger criteria have been met). A corresponding pop-up message ("Waiting for trigger") is generated if no trigger signal appears after approximately 2 sec. This message goes away when a trigger signal appears.	
Initial S/W Revision	Prior to A.02.00	

Periodic Timer Triggering:

This feature selects the internal periodic timer signal as the trigger. Trigger occurrences are set by the Periodic Timer parameter, which is modified by the Sync Source and Offset.

The figure below shows the action of the periodic timer trigger. Before reviewing the figure, we'll explain some uses for the periodic trigger.

A common application is measuring periodic burst RF signals for which a trigger signal is not easily available. For example, we might be measuring a TDMA radio which bursts every 20 ms. Let's assume that the 20 ms period is very consistent. Let's also assume that we do not have an external trigger source available that is synchronized with the period, and that the signal-to-noise ratio

of the signal is not high enough to provide a clean RF burst trigger at all of the analysis frequencies. For example, we might want to measure spurious transmissions at an offset from the carrier that is larger than the bandwidth of the RF burst trigger. In this application, we can set the Periodic Timer to a 20.00 ms period and adjust the offset from that timer to position our trigger just where we want it. If we find that the 20.00 ms is not exactly right, we can adjust the period slightly to minimize the drift between the period timer and the signal to be measured.

A second way to use this feature would be to use Sync Source temporarily, instead of Offset. In this case, we might tune to the signal in a narrow span and use the RF Burst trigger to synchronize the periodic timer. Then we would turn the sync source off so that it would not mis-trigger. Mis-triggering can occur when we are tuned so far away from the RF burst trigger that it is no longer reliable.

A third example would be to synchronize to a signal that has a reference time element of much longer period than the period of interest. In some CDMA applications, it is useful to look at signals with a short periodicity, by synchronizing that periodicity to the "even-second clock" edge that happens every two seconds. Thus, we could connect the even-second clock trigger to Ext1 and use then Ext1 as the sync source for the periodic timer.

The figure below illustrates this third example. The top trace represents the even-second clock. It causes the periodic timer to synchronize with the leading edge shown. The analyzer trigger occurs at a time delayed by the accumulated offset from the period trigger event. The periodic timer continues to run, and triggers continue to occur, with a periodicity determined by the analyzer time base. The timer output (labeled "late event") will drift away from its ideal time due to imperfect matching between the time base of the signal being measured and the time base of the analyzer, and also because of imperfect setting of the period parameter. But the synchronization is restored on the next even-second clock event. ("Accumulated offset" is described in the in the Offset function section.)

Period

Sets the period of the internal periodic timer clock. For digital communications signals, this is usually set to the frame period of your current input signal. In

the case that sync source is not set to OFF, and the external sync source rate is changed for some reason, the periodic timer is synchronized at the every external synchronization pulse by resetting the internal state of the timer circuit.

Key Path	Trigger, Periodic Timer
Remote Command	`:TRIGger[:SEQuence]:FRAMe:PERiod <time>`
	`:TRIGger[:SEQuence]:FRAMe:PERiod?`
Example	TRIG:FRAM:PER 100 ms
Dependencies	The invalid data indicator turns on when the period is changed, until the next sweep/measurement completes.
Couplings	The same period is used in the Gate Source selection of the period timer.
Preset	20 ms
	GSM: 4.615383
State Saved	Saved in instrument state
Min	100.000 ns
Max	559.0000 ms
Default Unit	S
Initial S/W Revision	Prior to A.02.00

Offset

Adjusts the accumulated offset between the periodic timer events and the trigger event. Adjusting the accumulated offset is different than setting an offset, and requires explanation.

The periodic timer is usually not synchronized with any external events, so the timing of its output events has no absolute meaning. Since the timing relative to external events (RF signals) is important, you need to be able to adjust (offset) it. However, you have no direct way to see when the periodic timer events occur. All that you can see is the trigger timing. When you want to adjust the trigger timing, you will be changing the internal offset between the periodic timer events and the trigger event. Because the absolute value of that internal offset is unknown, we will just call that the accumulated offset. Whenever the Offset parameter is changed, you are changing that accumulated offset. You can reset the displayed offset using Reset Offset Display. Changing the display does not

change the value of the accumulated offset, and you can still make additional changes to accumulated offset.

To avoid ambiguity, we define that an increase in the "offset" parameter, either from the knob or the SCPI adjust command, serves to delay the timing of the trigger event.

Key Path	Trigger, Periodic Timer
Remote Command	`:TRIGger[:SEQuence]:FRAMe:OFFSet <time>` `:TRIGger[:SEQuence]:FRAMe:OFFSet?`
Example	TRIG:FRAM:OFFS 1.2 ms
Notes	The front panel interface (for example, the knob), and this command, adjust the accumulated offset, which is shown on the active function display. However, the actual amount sent to the hardware each time the offset is updated is the delta value, that is, the current accumulated offset value minus the previous accumulated offset value. Note that the accumulated offset value is essentially arbitrary; it represents the accumulated offset from the last time the offset was zeroed (with the Reset Offset Display key). Note that this command does not change the period of the trigger waveform. Note also that Offset is used only when the sync source is set to OFF, otherwise delay is used, see section "Trig Delay" on page 4-350. An increase in the "offset" parameter, either from the knob or the SCPI adjust command, serves to delay the timing of the trigger event.
Notes	When the SCPI command is sent the value shown on the key (and the Active Function, if this happens to be the active function) is updated with the new value. However, the actual amount sent to the hardware is the delta value, that is, the current accumulated offset value minus the previous accumulated offset value. The SCPI query simply returns the value currently showing on the key.
Dependencies	The invalid data indicator turns on when the offset is changed, until the next sweep/measurement completes.
Couplings	The same offset is used in the Gate Source selection of the period timer.
Preset	0 s
State Saved	Saved in instrument state
Min	–10.000 s
Max	10.000 s
Default Unit	S
Initial S/W Revision	Prior to A.02.00

Reset Offset Display

Resets the value of the periodic trigger offset display setting to 0.0 seconds. The current displayed trigger location may include an offset value defined with the Offset key. Pressing this key redefines the currently displayed trigger location as the new trigger point that is 0.0 s offset. The Offset key can then be used to add offset relative to this new timing.

Key Path	Trigger, Periodic Timer
Remote Command	`:TRIGger[:SEQuence]:FRAMe:OFFSet:DISPlay:RESet`
Example	TRIG:FRAM:OFFS:DISP:RES
Initial S/W Revision	Prior to A.02.00

Sync Source

Selects a signal source for you to synchronize your periodic timer trigger to, otherwise you are triggering at some arbitrary location in the frame. Synchronization reduces the precision requirements on the setting of the period.

For convenience you may adjust the level and slope of the selected sync source in a conditional branch setup menu accessed from the Sync Source menu. Note that these settings match those in the Trigger and Gate Source menus; that is, each trigger source has only one value of level and slope, regardless of which menu it is accessed from.

Key Path	Trigger, Periodic Timer
Remote Command	`:TRIGger[:SEQuence]:FRAMe:SYNC EXTernal1 | EXTernal2 | RFBurst | OFF` `:TRIGger[:SEQuence]:FRAMe:SYNC?`
Example	TRIG:FRAM:SYNC EXT2
Dependencies	In some models, there is no second External input. In these models, the External 2 key is blanked and the EXTernal2 parameter will generate a “Hardware missing; Not available for this model number” message.
Preset	Off GSM/EDGE: RFBurst
State Saved	Saved in instrument state
Readback	The current setting is read back to this key and it is also Readback to the previous Periodic

	Timer trigger key.
Backwards	`:TRIGger[:SEQuence]:FRAMe:SYNC EXTernal`
Compatibility SCPI	For backward compatibility, the parameter EXTernal is mapped to EXTernal1
Initial S/W Revision	Prior to A.02.00
Modified at S/W Revision	A.03.00

Off

Turns off the sync source for your periodic trigger. With the sync source off, the timing will drift unless the signal source frequency is locked to the analyzer frequency reference.

Key Path	Trigger, Periodic Timer, Sync Source
Example	TRIG:FRAM:SYNC OFF
Readback	Off
Initial S/W Revision	Prior to A.02.00

External 1

Pressing this key, when it is not selected, selects an external input signal as the trigger. A new sweep/measurement will start when the external trigger condition is met using the external 1 input connector on the rear panel.

Pressing this key, when it is already selected, accesses the external 1 trigger setup menu.

Key Path	Trigger	
Example	TRIG:SOUR EXT1	Swept SA measurement
	TRIG:<meas>:SOUR EXT1	Measurements other than Swept SA
Dependencies	Grayed out if in use by Point Trigger in the Source Setup menu.	
	Forced to Free Run if already selected and Point Trigger is set to External 1.	
State Saved	Saved in instrument state	
Status		

Bits/OPC dependencies	The Status Operation Register bit 5 "Waiting for Trigger" is set at the same time as the Sweeping or Measuring bit is set. It is cleared when the trigger actually occurs (that is, after the trigger event occurs and all the applicable trigger criteria have been met). A corresponding pop-up message ("Waiting for trigger") is generated if no trigger signal appears after approximately 2 sec. This message goes away when a trigger signal appears.
Initial S/W Revision	Prior to A.02.00

Trig Slope

Controls the trigger polarity. It is set positive to trigger on a rising edge and negative to trigger on a falling edge.

Key Path	Trigger, External 1
Remote Command	`:TRIGger[:SEQuence]:EXTernal1:SLOPe POSitive|NEGative`
	`:TRIGger[:SEQuence]:EXTernal1:SLOPe?`
Example	TRIG:EXT1:SLOP NEG
Couplings	This same slope is used in the Ext1 selection for the trigger source in the Trigger menu and for the period timer sync source (in the Trigger menu and in the Gate Source menu).
Preset	POSitive
State Saved	Saved in instrument state
Backwards Compatibility SCPI	`:TRIGger[:SEQuence]:EXTernal:SLOPe`
	For backward compatibility, the parameter EXTernal is mapped to EXTernal1
Backwards Compatibility SCPI	`:TRIGger[:SEQuence]:FRAMe:EXTernal1:SLOPe`
Backwards Compatibility Notes	The legacy :TRIGger[:SEQuence]:SLOPe command affects the slopes for the VID, LINE, EXT1, EXT2, and RFB triggers.
Initial S/W Revision	Prior to A.02.00

Trigger Level

Sets the value where the external 1 trigger input will trigger a new sweep/measurement.

Key Path	Trigger, External 1
Remote Command	`:TRIGger[:SEQuence]:EXTernal1:LEVel <level>`
	`:TRIGger[:SEQuence]:EXTernal1:LEVel?`
Example	TRIG:EXT1:LEV 0.4 V
Couplings	This same level is used for the Ext1 trigger source in the Trigger menu, for the Ext1 selection in the Periodic Timer sync source (in the Trigger menu and in the Gate Source menu), and also for the Ext1 selection in the Gate Source menu.
Preset	1.2 V
State Saved	Saved in instrument state
Min	–5 V
Max	5 V
Default Unit	V
Backwards Compatibility SCPI	`:TRIGger[:SEQuence]:EXTernal:LEVel`
	For backward compatibility, the parameter EXTernal is mapped to EXTernal1
Backwards Compatibility SCPI	`:TRIGger[:SEQuence]:FRAMe:EXTernal1:LEVel`
Initial S/W Revision	Prior to A.02.00

External 2

Pressing this key, when it is not selected, selects an external input signal as the trigger. A new sweep/measurement will start when the external trigger condition is met using the external 2 input connector. The external trigger 2 input connector is on the rear panel.

Pressing this key, when it is already selected, accesses the external 2 trigger setup menu.

Key Path	Trigger	
Example	TRIG:SOUR EXT2	Swept SA measurement
	TRIG:<meas>:SOUR EXT2	Measurements other than Swept SA
Dependencies	In some models, there is no second External input. In these models, the External 2 key is blanked and the EXTernal2 parameter will generate a “Hardware missing; Not available for this model number” message.	

	Grayed out if in use by Point Trigger in the Source Setup menu. Forced to Free Run if already selected and Point Trigger is set to External 2.
State Saved	Saved in instrument state
Status Bits/OPC dependencies	The Status Operation Register bit 5 "Waiting for Trigger" is set at the same time as the Sweeping or Measuring bit is set. It is cleared when the trigger actually occurs (that is, after the trigger event occurs and all the applicable trigger criteria have been met). A corresponding pop-up message ("Waiting for trigger") is generated if no trigger signal appears after approximately 2 sec. This message goes away when a trigger signal appears.
Initial S/W Revision	Prior to A.02.00
Modified at S/W Revision	A.03.00

Trig Slope

Controls the trigger polarity. It is set positive to trigger on a rising edge and negative to trigger on a falling edge.

Key Path	Trigger, External 2
Remote Command	`:TRIGger[:SEQuence]:EXTernal2:SLOPe POSitive|NEGative` `:TRIGger[:SEQuence]:EXTernal2:SLOPe?`
Example	TRIG:EXT2:SLOP NEG
Couplings	This same slope is used in the Ext2 selection for the trigger source in the Trigger menu and for the period timer sync source (in the Trigger menu and in the Gate Source menu).
Preset	POSitive
State Saved	Saved in instrument state
Backwards Compatibility SCPI	`:TRIGger[:SEQuence]:FRAMe:EXTernal2:SLOPe`
Backwards Compatibility Notes	The legacy :TRIGger[:SEQuence]:SLOPe command affects the slopes for the VID, LINE, EXT1, EXT2, and RFB triggers.
Initial S/W Revision	Prior to A.02.00

Trigger Level

Sets the value where the external 2 trigger input will trigger a new sweep/measurement.

Key Path	Trigger, External 2
Remote Command	`:TRIGger[:SEQuence]:EXTernal2:LEVel` `:TRIGger[:SEQuence]:EXTernal2:LEVel?`
Example	TRIG:EXT2:LEV 1.1 V
Couplings	This same level is used for the Ext2 trigger source in the Trigger menu, for the Ext2 selection in the Periodic Timer sync source (in the Trigger menu and in the Gate Source menu), and also for the Ext2 selection in the Gate Source menu.
Preset	1.2 V
State Saved	Saved in instrument state
Min	–5 V
Max	5 V
Default Unit	V
Backwards Compatibility SCPI	`:TRIGger[:SEQuence]:FRAMe:EXTernal2:LEVel`
Initial S/W Revision	Prior to A.02.00

RF Burst

Pressing this key, when it is not selected, selects the RF Burst as the trigger. A new sweep/measurement will start when an RF burst envelope signal is identified from the signal at the RF Input connector. Pressing this key, when it is already selected, accesses the RF Burst trigger setup menu.

In some models, a variety of burst trigger circuitry is available, resulting in various available burst trigger bandwidths. The analyzer automatically chooses the appropriate trigger path based on the hardware configuration and other settings of the analyzer.

Key Path	Trigger	
Example	TRIG:SOUR RFB	Swept SA measurement

	TRIG:<meas>:SOUR RFB Measurements other than Swept SA
State Saved	Saved in instrument state
Status Bits/OPC dependencies	The Status Operation Register bit 5 "Waiting for Trigger" is set at the same time as the Sweeping or Measuring bit is set. It is cleared when the trigger actually occurs (that is, after the trigger event occurs and all the applicable trigger criteria have been met). A corresponding pop-up message ("Waiting for trigger") is generated if no trigger signal appears after approximately 2 sec. This message goes away when a trigger signal appears.
Backwards Compatibility Notes	
Initial S/W Revision	Prior to A.02.00
Modified at S/W Revision	A.04.00

Trigger Slope

It is set positive to trigger on a rising edge and negative to trigger on a falling edge.

Key Path	Trigger, RF Burst
Remote Command	`:TRIGger[:SEQuence]:RFBurst:SLOPe POSitive|NEGative`
	`:TRIGger[:SEQuence]:RFBurst:SLOPe?`
Example	TRIG:RFB:SLOP NEG
Couplings	This same slope is used in the RF Burst selection for the trigger source in the Trigger menu and for the period timer sync source (in the Trigger menu and in the Gate Source menu).
Preset	POSitive
State Saved	Saved in instrument state
Backwards Compatibility SCPI	`:TRIGger[:SEQuence]:FRAMe:RFBurst:SLOPe`
Backwards Compatibility Notes	The legacy :TRIGger[:SEQuence]:SLOPe command affects the slopes for the VID, LINE, EXT1, EXT2, and RFB triggers.

Initial S/W Revision	Prior to A.02.00

Absolute Trigger Level

Sets the absolute trigger level for the RF burst envelope.

When using the External Mixing path, the Absolute Trigger Level is uncalibrated because the factory default was set to accommodate the expected IF levels for the RF path.

Key Path	Trigger, RF Burst
Scope	Meas Global
Remote Command	`:TRIGger[:SEQuence]:RFBurst:LEVel:ABSolute <ampl>`
	`:TRIGger[:SEQuence]:RFBurst:LEVel:ABSolute?`
Example	TRIG:RFB:LEV:ABS 10 dBm
	sets the trigger level of the RF burst envelope signal to the absolute level of 10 dBm
Notes	Sending this command does not switch the setting from relative to absolute; to switch it you need to send the :TRIGger[:SEQuence]:RFBurst:LEVel:TYPE command, below.
	Amplitude Corrections are not taken into account by the Absolute Trigger Level. For example, if you have given yourself effective gain with an amplitude correction factor, the Absolute Trigger will not fire until you have set the trigger level that far below the displayed signal level, rather than simply to the displayed signal level. This is only true for Amplitude Corrections, not External Gain or Ref Level Offset functions.
	If mode is Bluetooth, the default value is –50 dBm.
Couplings	This same level is used for the RF Burst trigger source in the Trigger menu, for the RF Burst selection in the Periodic Timer sync source (in the Trigger menu and in the Gate Source menu), and also for the RF Burst selection in the Gate Source menu
Preset	–20 dBm
State Saved	Saved in state
Min	–200 dBm
Max	100 dBm
Default Unit	depends on the current selected Y-Axis unit
Backwards Compatibility SCPI	`:TRIGger[:SEQuence]:FRAMe:RFBurst:LEVel:ABSolute`

Initial S/W Revision	Prior to A.02.00
Modified at S/W Revision	A.04.00

Key Path	Trigger, RF Burst
Remote Command	`:TRIGger[:SEQuence]:RFBurst:LEVel:TYPE ABSolute|RELative` `:TRIGger[:SEQuence]:RFBurst:LEVel:TYPE?`
Example	TRIG:RFB:LEV:TYPE REL sets the trigger level type of the RF burst trigger to Relative.
Preset	ABSolute
State Saved	Saved in instrument state
Initial S/W Revision	Prior to A.02.00
Modified at S/W Revision	A.04.00

Trig Delay

This setting delays the measurement timing relative to the Periodic Timer.

Key Path	Trigger, Periodic Timer

Remote Command	`:TRIGger[:SEQuence]:FRAMe:DELay <time>`
	`:TRIGger[:SEQuence]:FRAMe:DELay?`
	`:TRIGger[:SEQuence]:FRAMe:DELay:STATe OFF|ON|0|1`
	`:TRIGger[:SEQuence]:FRAMe:DELay:STATe?`

Notes	Note that delay is used when the sync source is not set to OFF. If the sync source is set to OFF, offset is used.
Preset	Off, 1.000 us
State Saved	Saved in instrument state
Min	–150 ms
Max	+500 ms
Default Unit	s
Initial S/W Revision	Prior to A.02.00

Auto/Holdoff

Opens up a menu that lets you adjust Auto Trigger and Trigger Holdoff parameters

Key Path	Trigger
Readback line	Displays a summary of the Auto Trig and Holdoff settings, in square brackets First line: Auto Off or Auto On Second Line: "Hldf" followed by: • If Holdoff is Off, readback Off • If Holdoff On and Type = Normal, readback value • If Holdoff On and Type = Above, readback value followed by AL • If Holdoff On and Type = Below, readback value followed by BL • If Holdoff Type selection is not supported by the current measurement, Holdoff Type is always Normal
Initial S/W Revision	A.02.00

Auto Trig

Sets the time that the analyzer will wait for the trigger conditions to be met. If they are not met after that much time, then the analyzer is triggered anyway.

Key Path	Trigger, Auto/Holdoff

Remote Command	`:TRIGger[:SEQuence]:ATRigger <time>`
	`:TRIGger[:SEQuence]:ATRigger?`
	`:TRIGger[:SEQuence]:ATRigger:STATe OFF|ON|0|1`
	`:TRIGger[:SEQuence]:ATRigger:STATe?`

Example	TRIG:ATR:STAT ON TRIG:ATR 100 ms
Notes	The "time that the analyzer will wait" starts when the analyzer is ready for a trigger, which may be hundreds of ms after the data acquisition for a sweep is done. The "time" ends when the trigger condition is satisfied, not when the delay ends.
Preset	Off, 100 ms
State Saved	Saved in instrument state

Min	1 ms
Max	100 s
Default Unit	s
Initial S/W Revision	Prior to A.02.00

Trig Holdoff

Sets the holdoff time between triggers. When the trigger condition is satisfied, the trigger occurs, the delay begins, and the holdoff time begins. New trigger conditions will be ignored until the holdoff time expires. For a free-running trigger, the holdoff value is the minimum time between triggers.

Key Path	Trigger, Auto/Holdoff
Remote Command	`:TRIGger[:SEQuence]:HOLDoff <time>`
	`:TRIGger[:SEQuence]:HOLDoff?`
	`:TRIGger[:SEQuence]:HOLDoff:STATe OFF|ON|0|1`
	`:TRIGger[:SEQuence]:HOLDoff:STATe?`
Example	TRIG:HOLD:STAT ON
	TRIG:HOLD 100 ms
Preset	Off, 100 ms
State Saved	Saved in instrument state
Min	0 s
Max	0.5 s
Default Unit	s
Initial S/W Revision	Prior to A.02.00

Holdoff Type

Lets you set the Trigger Holdoff Type.

NOTE Holdoff Type is not supported by all measurements. If the current measurement does not support it, this key will be blank and the Holdoff Type will be Normal. If the Holdoff Type SCPI is sent while in such a measurement, the SCPI will be accepted and the setting remembered, but it will have no effect until a measurement is in force that supports Holdoff Type.

Trigger Holdoff Type functionality:

Key Path	Trigger, Auto/Holdoff
Remote Command	`:TRIGger[:SEQuence]:HOLDoff:TYPE NORMal|ABOVe|BELow`
	`:TRIGger[:SEQuence]:HOLDoff:TYPE?`
Example	TRIG:HOLD:TYPE NORM
Preset	All modes but GSM/EDGE: Normal
	GSM/EDGE: Below
State Saved	Saved in instrument state
Initial S/W Revision	A.02.00

User Preset

Accesses a menu that gives you the following three choices:

• User Preset – recalls a state previously saved using the Save User Preset function.

• User Preset All Modes – presets all of the modes in the analyzer

• Save User Preset – saves the current state for the current mode

Key Path	Front-panel key
Backwards Compatibility Notes	User Preset is actually loading a state, and in legacy analyzers, it was possible to load a state without affecting the trace data, limit lines or correction data. Similarly it was possible to do a User Preset without affecting the trace data, limit lines or correction data. In the X-Series, "state" always includes all of this data; so whenever state is loaded, or User Preset is executed, all of the traces, limit lines and corrections are affected. Although this differs from previous behavior, it is desirable behavior, and should not cause adverse issues for users. On ESA and PSA, User Preset affected the entire instrument's state. In the X-Series, User Preset only recalls the state for the active mode. There is a User Preset file for each mode. User Preset can never cause a mode switch as it can in legacy analyzers. If you want to recall all modes to their user preset file state, you will need to do a User Preset after mode switching into each mode. User Preset recalls mode state which can now include data like traces; whereas on ESA and PSA, User Preset did not affect data.
Initial S/W Revision	Prior to A.02.00

User Preset

User Preset sets the state of the currently active mode back to the state that was previously saved for this mode using the Save User Preset menu key or the SCPI command, SYST:PRES:USER:SAV. It not only recalls the Mode Preset settings, but it also recalls all of the mode persistent settings, and the Input/Outpit system setting that existed at the time Save User Preset was executed.

If a Save User Preset has not been done at any time, User Preset recalls the default user preset file for the currently active mode. The default user preset files are created if, at power-on, a mode detects there is no user preset file. There will never be a scenario when there is no user preset file to restore. For each mode, the default user preset state is the same state that would be saved if a Save User Preset is performed in each mode right after doing a Restore Mode Default and after a Restore Input/Output Defaults.

The User Preset function does the following:

Key Path	User Preset
Remote Command	`:SYSTem:PRESet:USER`
Example	:SYST:PRES:USER:SAVE:SYST:PRES:USER
Notes	:SYST:PRES:USER:SAVE is used to save the current state as the user preset state. Clears all pending OPC bits. The Status Byte is set to 0. Pressing the User Preset front-panel key while already in the User Preset menu will cause the User Preset to get executed
Couplings	A user preset will cause the currently running measurement to be aborted and cause the saved measurement to be active. Recalling a User Preset file has the same issues that recalling a Save State file has. Some settings may need to be limited and therefore re-coupled, since the capabilities of the mode may have changes when the User Preset file was last saved.
Initial S/W Revision	Prior to A.02.00

User Preset All Modes

Recalls all of the User Preset files for each mode, switches to the power-on mode, and activates the saved measurement from the power-on mode User Preset file.

NOTE When the instrument is secured, all of the user preset files are converted back to their default user preset files.

The User Preset function does the following:

Key Path	User Preset
Remote Command	`:SYSTem:PRESet:USER:ALL`
Example	:SYST:PRES:USER:SAVE:SYST:PRES:USER:ALL
Notes	Clears all pending OPC bits. The Status Byte is set to 0. :SYST:PRES:USER:SAVE is used to save the current state as the user preset state.
Couplings	A user preset will cause the currently running measurement to be aborted, cause a mode switch to the power-on mode, and cause the saved measurement to be active in the power-on mode. Recalling a User Preset file has the same issues that recalling a Save State file has. Some settings may need to be limited and therefore re-coupled, since the capabilities of the mode may have changes when the User Preset file was last saved.
Initial S/W Revision	Prior to A.02.00

Save User Preset

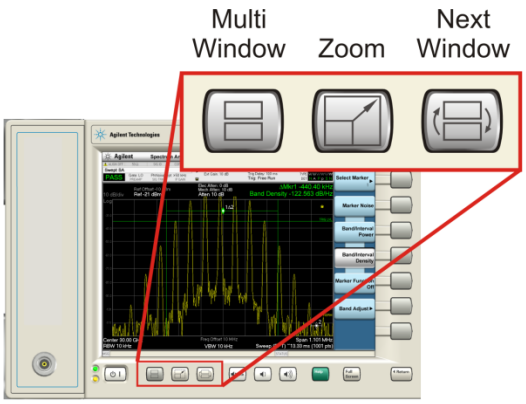
Saves the currently active mode and its State. You can recall this User Preset file by pressing the User Preset menu key or sending the SYST:PRES:USER remote command. This same state is also saved by the Save State function.

Key Path	User Preset
Remote Command	`:SYSTem:PRESet:USER:SAVE`
Example	:SYST:PRES:USER:SAVE
Notes	:SYST:PRES:SAVE creates the same file as if the user requested a *SAV or a MMEM:STOR:STAT, except User Preset Save does not allow the user to specify the filename or the location of the file.
Initial S/W Revision	Prior to A.02.00

Window Control Keys

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

keys.



Multi-Window

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

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

Next Window

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

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

Four-window display:
1
23
4
Two-Window display:

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

One and only one window is always selected. The selected window has the focus; this means that all window-specific key presses apply only to that

window. You can tell which window is selected by the thick green border around it. If a window is not selected, its boundary is gray.

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

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

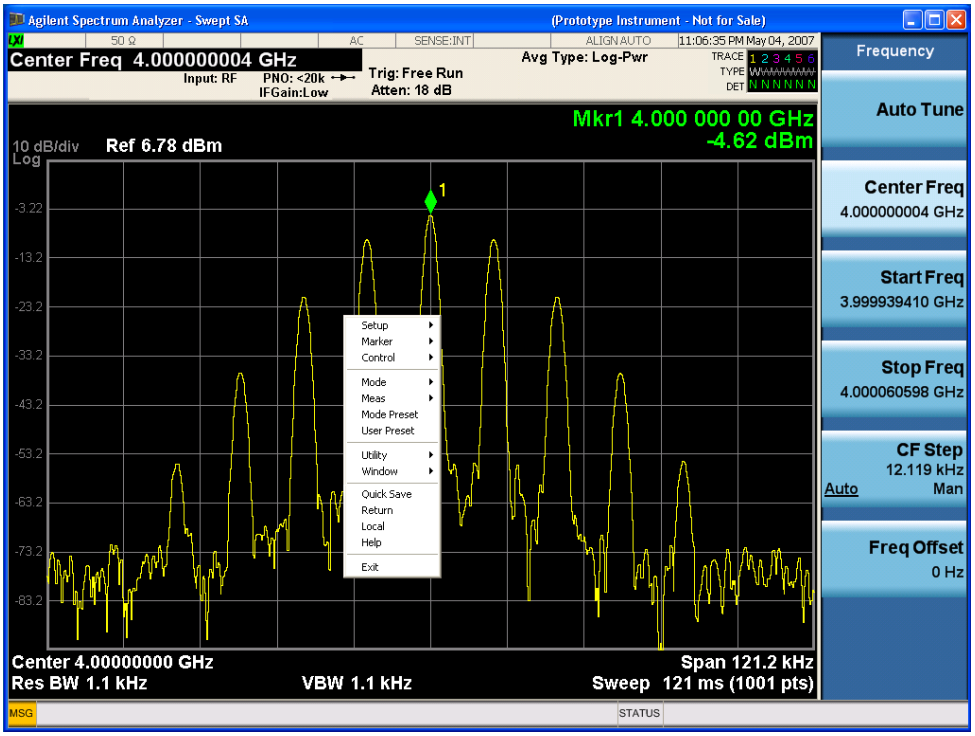
NOTE When this key is pressed in Help Mode, it toggles focus between the table of contents window and the topic pane window.

Mouse and Keyboard Control

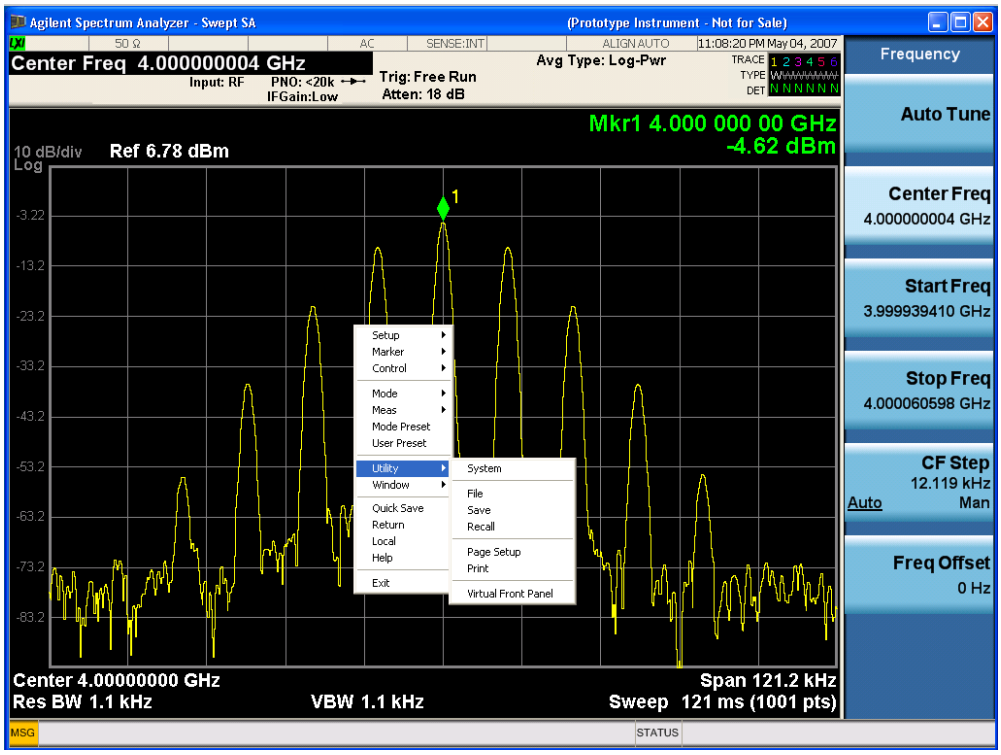
If you do not have access to the instrument front-panel, there are several ways that a mouse and PC Keyboard can give you access to functions normally accessed using the front-panel keys.

Right-Click

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

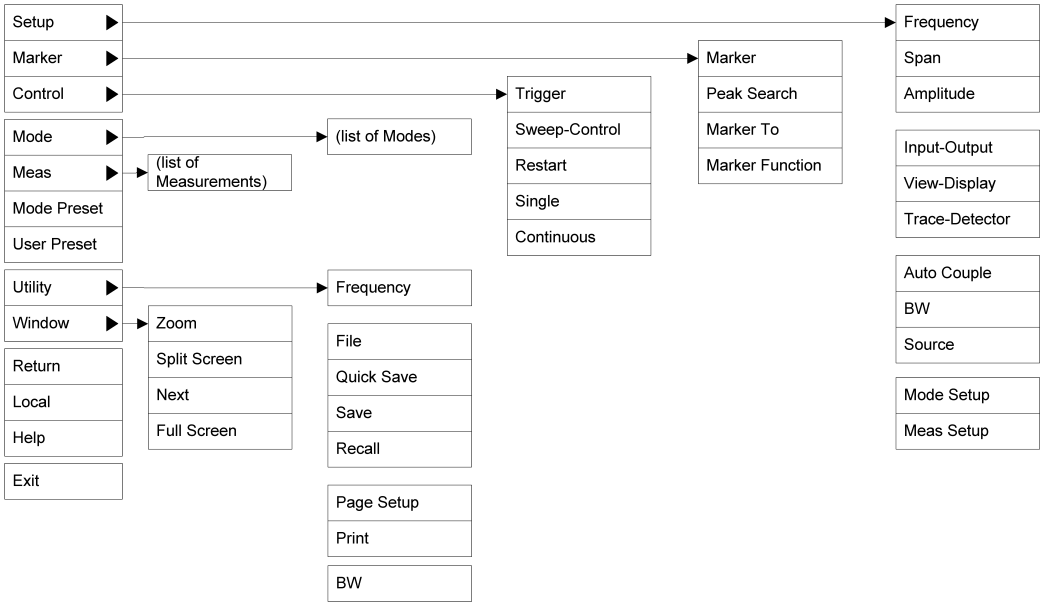


Placing the mouse on one of the rows marked with a right arrow symbol will cause that row to expand, as for example below where the mouse is hovered over the “Utility” row:



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

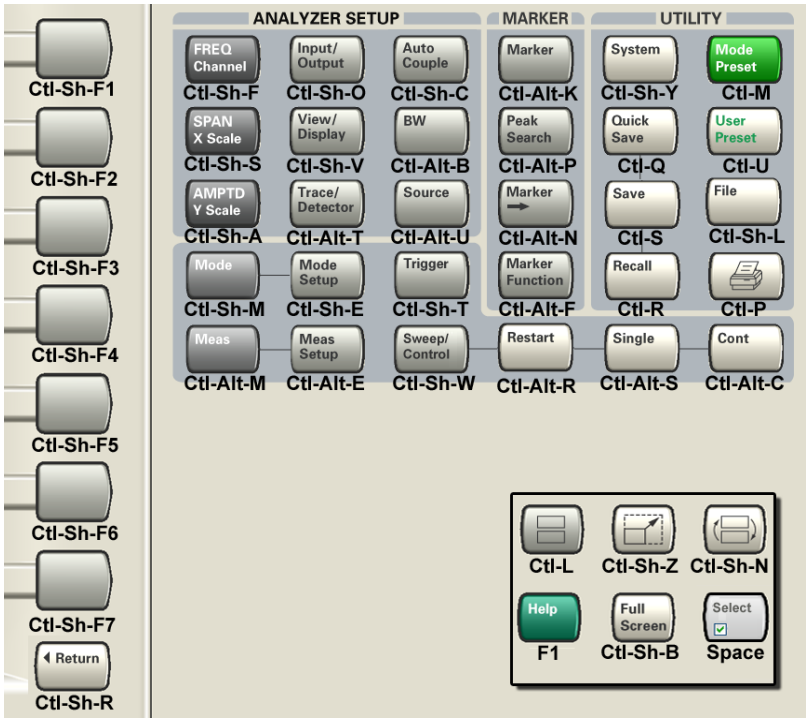
If you have a PC keyboard plugged in (or via Remote Desktop), certain key codes on the PC keyboard map to front-panel keys on the GPSA front panel. These key codes are shown below:

Front-panel key	Key code
Frequency	CTRL+SHIFT+F
Span	CTRL+SHIFT+S
Amplitude	CTRL+SHIFT+A
Input/Output	CTRL+SHIFT+O
View/Display	CTRL+SHIFT+V
Trace/Detector	CTRL+ALT+T
Auto Couple	CTRL+SHIFT+C
Bandwidth	CTRL+ALT+B
Source	CTRL+SHIFT+E
Marker	CTRL+ALT+K
Peak Search	CTRL+ALT+P
Marker To	CTRL+ALT+N
Marker Function	CTRL+ALT+F
System	CTRL+SHIFT+Y

Quick Save	CTRL+Q
Save	CTRL+S
Recall	CTRL+R
Mode Preset	CTRL+M
User Preset	CTRL+U
Print	CTRL+P
File	CTRL+SHIFT+L
Mode	CTRL+SHIFT+M
Measure	CTRL+ALT+M
Mode Setup	CTRL+SHIFT+E
Meas Setup	CTRL+ALT+E
Trigger	CTRL+SHIFT+T
Sweep/Control	CTRL+SHIFT+W
Restart	CTRL+ALT+R
Single	CTRL+ALT+S
Cont	CTRL+ALT+C
Zoom	CTRL+SHIFT+Z
Next Window	CTRL+SHIFT+N
Split Screen	CTRL+L
Full Screen	CTRL+SHIFT+B
Return	CTRL+SHIFT+R
Mute	Mute
Inc Audio	Volume Up
Dec Audio	Volume Down
Help	F1
Control	CTRL
Alt	ALT
Enter	Return
Cancel	Esc
Del	Delete
Backspace	Backspace
Select	Space
Up Arrow	Up
Down Arrow	Down

Left Arrow	Left
Right Arrow	Right
Menu key 1	CTRL+SHIFT+F1
Menu key 2	CTRL+SHIFT+F2
Menu key 3	CTRL+SHIFT+F3
Menu key 4	CTRL+SHIFT+F4
Menu key 5	CTRL+SHIFT+F5
Menu key 6	CTRL+SHIFT+F6
Menu key 7	CTRL+SHIFT+F7
Backspace	BACKSPACE
Enter	ENTER
Tab	Tab
1	1
2	2
3	3
4	4
5	5
6	6
7	7
8	8
9	9
0	0

This is a pictorial view of the table:



RF Preselector

This menu provides the ability to switch to the particular filter in the Conducted or Radiated Band in order to see the frequency response of the specific RF Preselector filter. The Conducted band has 13 fixed filters and Radiated band has 6 tunable filters and 1 fixed filter. The tunable filters will be characterized during the Factory Calibration test by executing the Characterize RF Preselector, All Bands button. Once after the filter is characterized, the amplitude correction for the RF Preselector path will be invalid and the receiver needs to go through the Factory Flatness calibration tests for the RF Preselector Path. The internal Calibrators for RF Preselector consists of DDS (Direct Digital Synthesizer) and Noise Source. The DDS operating range is from DC to 60 MHz whereas Noise Source is from 10 MHz to 4 GHz. Both the calibrators are used by the firmware to execute the RF Preselector System alignment to improve the amplitude variation of the RF Preselector path.

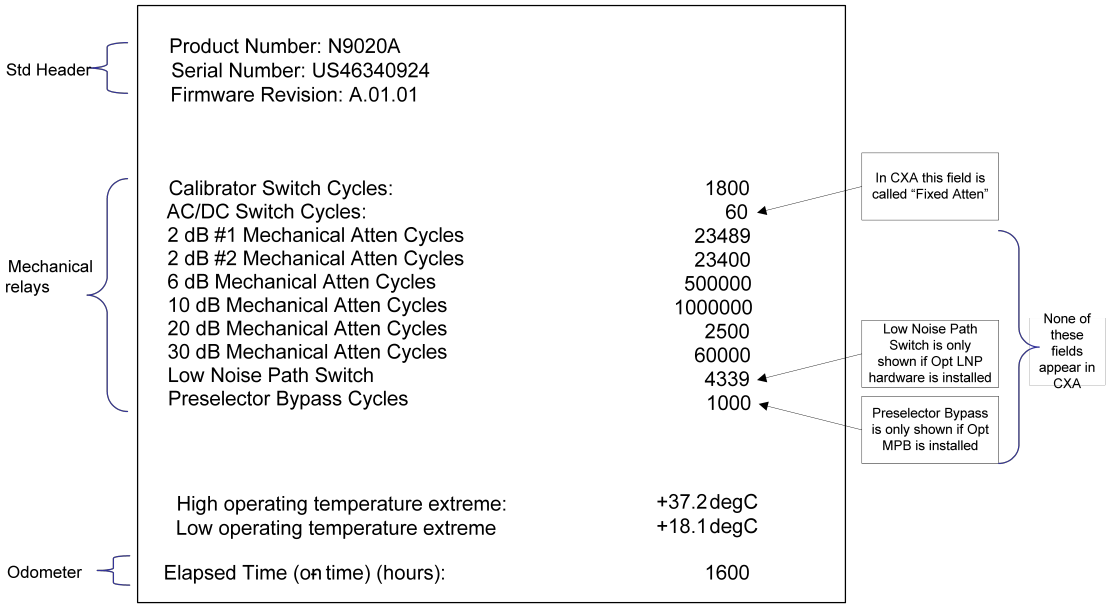
The Diagnostics key in the System menu gives you access to basic diagnostic capabilities of the instrument.

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

Show Hardware Statistics

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

The display should appear listing the statistics, product number, serial number, and firmware revision.



The data will be updated only when the Show Hardware Statistics menu key is pressed, it will not be updated while the screen is displayed.

The tabular data should be directly printable.

Key Path	System, Diagnostics
Mode	All
Notes	The values displayed on the screen are only updated upon entry to the screen and not updated while the screen is being displayed.
Initial S/W Revision	Prior to A.02.00

SCPI for Show Hardware Statistics (Remote Commands Only)

Each of the hardware statistic items can be queriedvia SCPI.

Query the Operating Temperature Extremes

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

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

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

Query the Elapsed Time since 1st power on

Returns the elapsed on-time in minutes since 1st power-on.

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

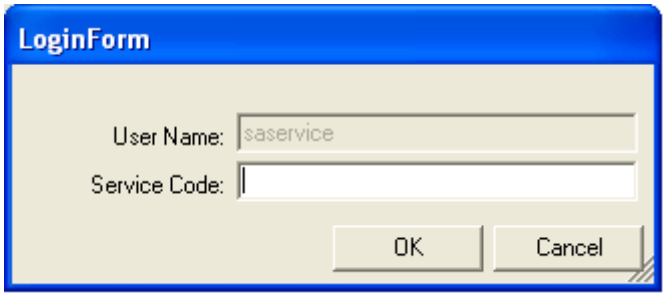
Query the Mechanical Relay Cycle Count

Returns the count of mechanical relay cycles.

Remote Command	`:SYSTem:MRELay:COUNt?`
Example	:SYST:MREL:COUN?
Notes	Query Only
	The return value is a comma separated list of the individual counts for each mechanical relay.
	The position of the relays in the list is:
	"<Cal Signal>,<AC/DC>,<2dB #1 Atten>,<2dB #2 Atten>,<6dB Atten>,<10dB Atten>,<20dB Atten>,<30dB Atten>,<Fixed Atten>,<Low Noise Path Switch>,<Presel Bypass>"
	Items in the list not pertaining to your particular hardware configuration will return as –999 for those items.
Initial S/W Revision	Prior to A.02.00
Modified at S/W Revision	A.03.00, A.04.00

Advanced

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



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

Key Path	System, Diagnostics
Notes	Password is required to access this menu.
Initial S/W Revision	Prior to A.02.00

	Agilent Converged	PSA
IP Address	SYSTem:COMMunicate:LAN:ADDRess <string>	:SYSTem:COMMunicate:LAN[:SELF]:IP <string>
	SYSTem:COMMunicate:LAN:ADDRess?	:SYSTem:COMMunicate:LAN[:SELF]:IP?
Gateway	SYSTem:COMMunicate:LAN:DGATeway <string>	:SYSTem:COMMunicate:LAN[:SELF]:GATEway <string
	SYSTem:COMMunicate:LAN:DGATeway?	:SYSTem:COMMunicate:LAN[:SELF]:GATEway?
Subnet Mask	SYSTem:COMMunicate:LAN:SMASk <string>	:SYSTem:COMMunicate:LAN[:SELF]:SUBNetmask <string>
	SYSTem:COMMunicate:LAN:SMASk?	:SYSTem:COMMunicate:LAN[:SELF]:SUBNetmask?

View/Display

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

Key Path	Front-panel Key
Mode	Combined WLAN
Remote Command	`:DISPlay:CWLan:VIEW[:SELect]`
	RFENvelope|RESult|PARameter
	`:DISPlay:CWLan:VIEW[:SELect]?`
Example	DISP:CWL:VIEW RFEN
	DISP:CWL:VIEW?
Preset	RESult
State Saved	Saved in instrument state.
Range	RF Envelope|Result List|Param List
Initial S/W Revision	A.02.00

Display

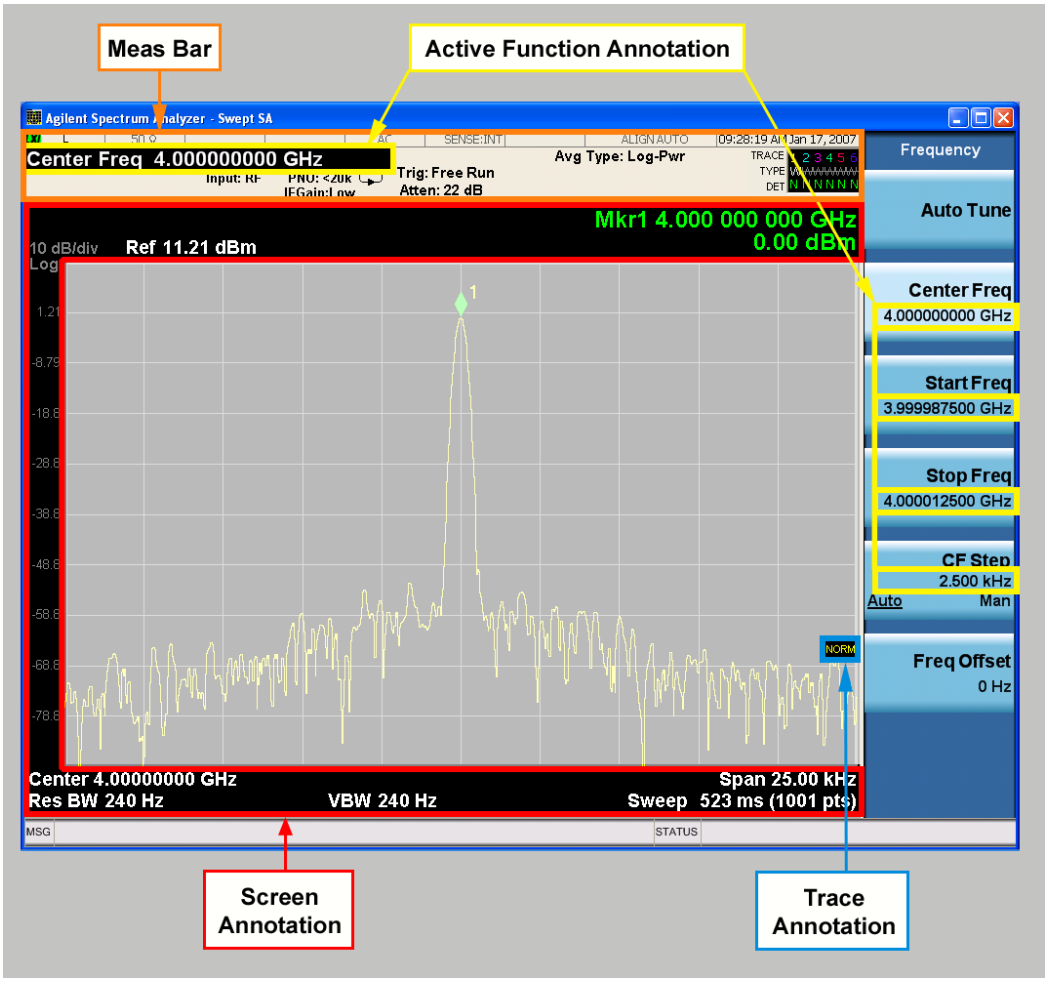
The Display menu is common to most measurements, and is used for configuring items on the display. Some Display menu settings apply to all the measurements in a mode, and some only to the current measurement. Those under the System Display Settings key apply to all measurements in all modes.

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

Annotation

Turns on and off various parts of the display annotation. The annotation is divided up into four categories:

See the figure below. Each type of annotation can be turned on and off individually.



Key Path	View/Display, Display
Initial S/W Revision	Prior to A.02.00

Meas Bar On/Off

This function turns the Measurement Bar on and off, including the settings panel. When off, the graticule area expands to fill the area formerly occupied by

the Measurement Bar.

Key Path	View/Display, Display, Annotation
Remote Command	`:DISPlay:ANNotation:MBAR[:STATe] OFF|ON|0|1`
	`:DISPlay:ANNotation:MBAR[:STATe]?`
Example	DISP:ANN:MBAR OFF
Dependencies	Grayed out and forced to OFF when System Display Settings, Annotation is set to Off.
Preset	On
	This should remain Off through a Preset when System Display Settings, Annotation is set to Off.
State Saved	Saved in instrument state.
Initial S/W Revision	Prior to A.02.00

Screen

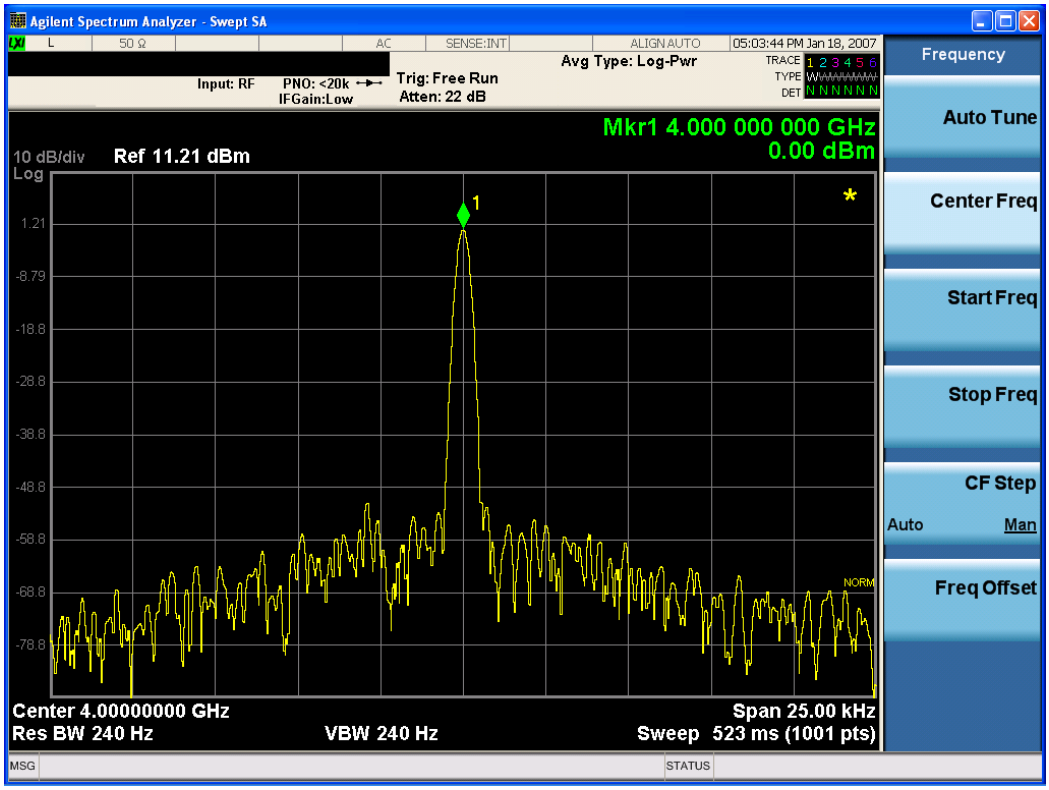
This controls the display of the annunciation and annotation around the graticule, including any annotation on lines (such as the display line, the threshold line, etc.) and the y-axis annotation. This does NOT include marker annotation (or the N dB result). When off, the graticule expands to fill the entire graticule area, leaving only the 1.5% gap above the graticule as described in the Trace/Detector chapter.

Key Path	View/Display, Display, Annotation
Remote Command	`:DISPlay:ANNotation:SCReen[:STATe] OFF|ON|0|1`
	`:DISPlay:ANNotation:SCReen[:STATe]?`
Example	DISP:ANN:SCR OFF
Dependencies	Grayed out and forced to OFF when System Display Settings, Annotation is set to Off.
Preset	On
	This should remain Off through a Preset when System Display Settings, Annotation is set to Off
State Saved	Saved in instrument state.
Initial S/W Revision	Prior to A.02.00

Active Function Values On/Off

Turns on and off the active function display in the Meas Bar, and all of the active function values displayed on the softkeys.

Note that all of the softkeys that have active functions have these numeric values blanked when this function is on. This is a security feature..



Key Path	View/Display, Display, Annotation
Remote Command	`:DISPlay:ACTivefunc[:STATe] ON|OFF|1|0`
	`:DISPlay:ACTivefunc[:STATe]?`
Example	DISP:ACT OFF
Dependencies	Grayed out and forced to OFF when System Display Settings, Annotation is set to Off.
Preset	On
	This should remain Off through a Preset when System Display Settings, Annotation is set to Off
State Saved	Saved in instrument state.

Initial S/W Revision	Prior to A.02.00

Title

Displays menu keys that enable you to change or clear a title on your display.

Key Path	View/Display, Display
Initial S/W Revision	Prior to A.02.00

Change Title

Writes a title into the "measurement name" field in the banner, for example, "Swept SA".

Press Change Title to enter a new title through the alpha editor. Press Enter or Return to complete the entry. Press ESC to cancel the entry and preserve your existing title.

The display title will replace the measurement name. It remains for this measurement until you press Change Title again, or you recall a state, or a Preset is performed. A title can also be cleared by pressing Title, Clear Title.

NOTE Notice the inclusion of the <measurement> parameter in the command below. Because each measurement remembers the Display Title, the command must be qualified with the measurement name. For the Swept SA measurement this is not the case; no <measurement> parameter is used when changing the Display Title for the Swept SA measurement.

Key Path	View/Display, Display, Title
Mode	All
Remote Command	`:DISPlay:<measurement>:ANNotation:TITLe:DATA <string>` `:DISPlay:<measurement>:ANNotation:TITLe:DATA?`
Example	DISP:ANN:TITL:DATA "This Is My Title" This example is for the Swept SA measurement in the Spectrum Analyzer mode. The SANalyzer <measurement> name is not used. DISP:ACP:ANN:TITL:DATA "This Is My Title"

	This example is for Measurements other than Swept SA.
	Both set the title to: This Is My Title
Notes	Pressing this key cancels any active function.
	When a title is edited the previous title remains intact (it is not cleared) and the cursor goes at the end so that characters can be added or BKSP can be used to go back over previous characters.
Preset	No title (measurement name instead)
State Saved	Saved in instrument state.
Initial S/W Revision	Prior to A.02.00

Clear Title

Clears a title from the front-panel display. Once cleared, the title cannot be retrieved. After the title is cleared, the current Measurement Name replaces it in the title bar.

Key Path	View/Display, Display, Title
Example	The following commands clear the title and restore the measurement's original title:
	DISP:ANN:TITL:DATA ""
	This example is for the Swept SA measurement in the Spectrum Analyzer mode. The SANalyzer <measurement> name is not used.
	DISP:ACP:ANN:TITL:DATA ""
	This example is for ACP; in measurements other than Swept SA the measurement name is required.
Notes	Uses the :DISPlay:<measurement>:ANNotation:TITLe:DATA <string> command with an empty string (in the Swept SA, the <measurement> is omitted).
Preset	Performed on Preset.
Initial S/W Revision	Prior to A.02.00

Graticule

Pressing Graticule turns the display graticule On or Off. It also turns the graticule y-axis annotation on and off.

Key Path	View/Display, Display
Remote Command	`:DISPlay:WINDow[1]:TRACe:GRATicule:GRID[:STATe] OFF|ON|0|1`
	`:DISPlay:WINDow[1]:TRACe:GRATicule:GRID[:STATe]?`
Example	DISP:WIND:TRAC:GRAT:GRID OFF
Notes	The graticule is the set of horizontal and vertical lines that make up the grid/divisions for the x-axis and y-axis.
Preset	On
State Saved	saved in instrument state
Initial S/W Revision	Prior to A.02.00

System Display Settings

These settings are "Mode Global" – they affect all modes and measurements and are reset only by Restore Misc Defaults or Restore System Defaults under System.

Key Path	View/Display, Display
Initial S/W Revision	Prior to A.02.00

Annotation Local Settings

This is a Mode Global override of the meas local annotation settings. When it is All Off, it forces Screen Annotation, Meas Bar, Trace, and Active Function Values settings to be OFF for all measurements in all modes. This provides the security based "annotation off" function of previous analyzers; hence it uses the legacy SCPI command.

When it is All Off, the Screen, Meas Bar, Trace, and Active Function Values keys under the Display, Annotation menu are grayed out and forced to Off. When Local Settings is selected, you are able to set the local annotation settings on a measurement by measurement basis.

Key Path	View/Display, Display, System Display Settings
Remote Command	`:DISPlay:WINDow[1]:ANNotation[:ALL] OFF|ON|0|1` `:DISPlay:WINDow[1]:ANNotation[:ALL]?`
Example	:DISP:WIND:ANN OFF
Preset	On (Set by Restore Misc Defaults)
State Saved	Not saved in instrument state.
Backwards Compatibility Notes	The WINDow parameter and optional subopcode is included for backwards compatibility but ignored – all windows are equally affected.
Initial S/W Revision	Prior to A.02.00

Themes

Accesses a menu of functions that enable you to choose the theme to be used when saving the screen image.

The Themes option is the same as the Themes option under the Display and Page Setup dialogs. It allows you to choose between themes to be used when saving the screen image.

Key Path	Save, Screen Image
Remote Command	`:MMEMory:STORe:SCReen:THEMe TDColor | TDMonochrome | FCOLor | FMONochrome` `:MMEMory:STORe:SCReen:THEMe?`
Example	:MMEM:STOR:SCR:THEM TDM
Preset	3D Color; Is not part of Preset, but is reset by Restore Misc Defaults or Restore System Defaults All and survives subsequent running of the modes.
Readback	3D Color | 3D Mono | Flat Color | Flat Mono
Backwards Compatibility Notes	In ESA and PSA we offer the choice of "Reverse Bitmap" or "Reverse Metafile" when saving screen images. This is much like the "Flat Color" theme available in X-Series. Also, if the user selected Reverse Bitmap AND a black&white screen image, that would be much like "Flat Monochrome". In other words, each of the X-Series themes has a similar screen image type in ESA/PSA. But they are not identical.
Initial S/W Revision	Prior to A.02.00

Flat Color

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

Key Path	Save, Screen Image, Themes
Example	MMEM:STOR:SCR:THEM FCOL
Readback	Flat Color
Initial S/W Revision	Prior to A.02.00

3D Monochrome

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

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

Flat Monochrome

Selects a format that is like Flat Color. But only black is used (no colors, not even gray), and no fill.

Key Path	Save, Screen Image, Themes
Example	MMEM:STOR:SCR:THEM FMON
Readback	Flat Mono
Initial S/W Revision	Prior to A.02.00

3D Color

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

Key Path	Save, Screen Image, Themes
Example	MMEM:STOR:SCR:THEM TDC
Readback	3D Color
Initial S/W Revision	Prior to A.02.00

Backlight

Accesses the display backlight on/off keys. This setting may interact with settings under the Windows "Power" menu.

When the backlight is off, pressing ESC, TAB, SPACE, ENTER, UP, DOWN, LEFT, RIGHT, DEL, BKSP, CTRL, or ALT turns the backlight on without affecting the application. Pressing any other key will turn backlight on and could potentially perform the action as well.

Key Path	View/Display, Display, System Display Settings
Remote Command	`:DISPlay:BACKlight ON|OFF` `:DISPlay:BACKlight?`
Preset	ON (Set by Restore Misc Defaults)
Initial S/W Revision	Prior to A.02.00

Backlight Intensity

An active function used to set the backlight intensity. It goes from 0 to 100 where 100 is full on and 0 is off. This value is independent of the values set under the Backlight on/off key.

Key Path	View/Display, Display, System Display Settings
Remote Command	`:DISPlay:BACKlight:INTensity <integer>` `:DISPlay:BACKlight:INTensity?`
Example	DISP:BACK:INT 50
Preset	100 (Set by Restore Misc Defaults)
Min	0
Max	100
Initial S/W Revision	Prior to A.02.00

Display Enable (Remote Command Only)

Turns the display on/off, including the display drive circuitry. The backlight stays lit so you can tell that the instrument is on. The display enable setting is mode global. The reasons for turning the display off are three:

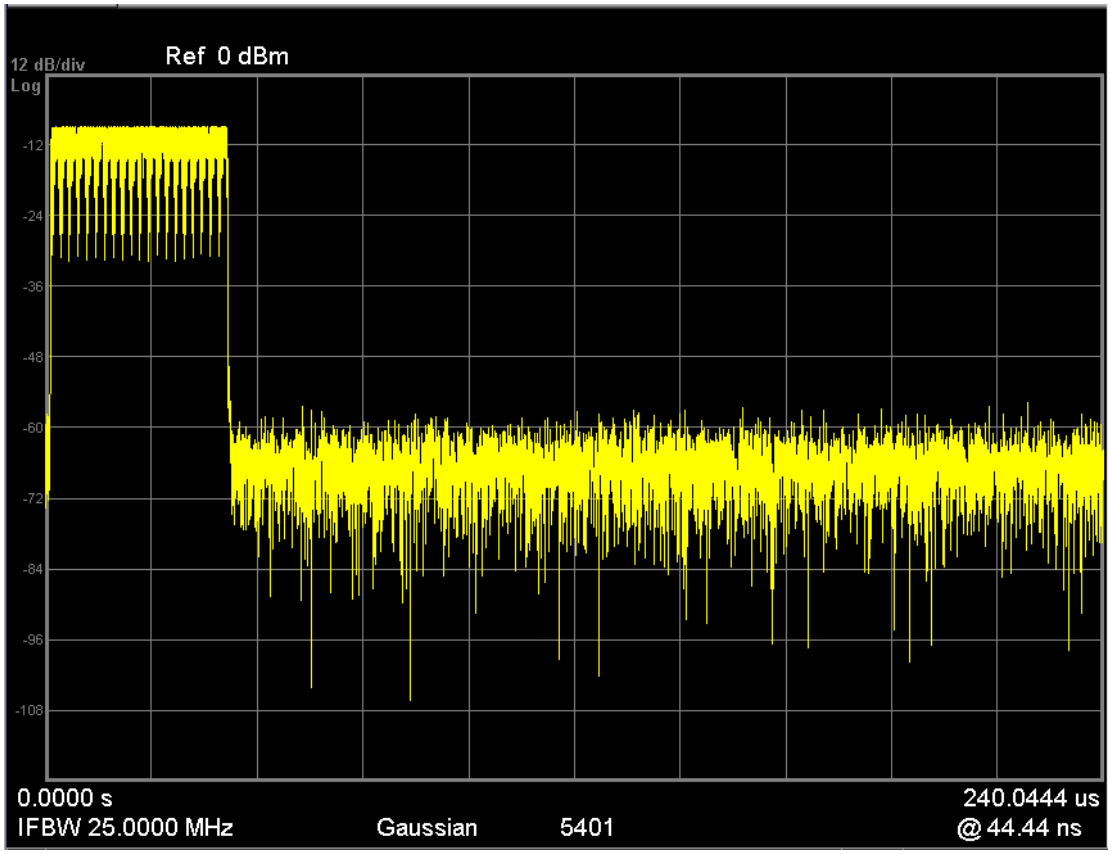
If you have turned off the display:

and you are using either the SYSTem:KLOCk command or GPIB local lockout, then no front-panel key press will turn the display back on. You must turn it back on remotely.

Remote Command	`:DISPlay:ENABle OFF|ON|0|1`
	`:DISPlay:ENABle?`
Example	DISP:ENAB OFF
Couplings	DISP:ENAB OFF turns Backlight OFF and DISP:ENAB ON turns Backlight ON. However, settings of Backlight do not change the state of DISP:ENAB
Preset	On
	Set by SYST:DEF MISC, but Not affected by *RST or SYSTem:PRESet.
State Saved	Not saved in instrument state.
Backwards Compatibility Notes	
Initial S/W Revision	Prior to A.02.00

RF Envelope View

The RF Envelope View is useful for setting the time alignment between target signal and the instrument; however, it is recommended to always use SCPI command ([:SENSe]:CWLan:TRACe:RF[:ENABle] OFF) to turn the trace off once the time alignment is finished. It is not recommended to use the RF Envelope View trace for post-processing. Captured raw data is available by READ SCPI for post processing.



Key Path View/Display

Initial S/W Revision A.02.00

Results List View

This view provides a list of all the numeric results defined in the last chapter. You can use the DOWN|UP key to scroll the list by using either the front panel or the key board.

Measurement	Measurement Item	Result
----------TX Power----------		
Burst1	Total Power	-66.775 dBm/18.000 MHz
	Peak PSD	-76.075 dBm/MHz
----------Mod Accuracy----------		
Burst1	Frequency Error	598610.688 Hz
	Symbol Clock Error	76.775 ppm
	Chip Cloak Error	---
	Center Frequency Leakage	-30.156 dB
	Spectral Flatness	FAIL
	Carrier Suppression	---
	RMS EVM	7.059 dB
	Peak EVM	25.792 dB

Key Path View/Display

Initial S/W Revision A.02.00

Parameters List View

This view shows name, remote command and value of available commands for this measurement. you can verify and change values with the up/down key from either the front panel or key board.

Name	SCPI	Value
EVM Meas Lower Threshold	:CALCulate:CWLan:EVM:BURSt:THReshold:LOWer	List:Amplitude[36]
EVM Meas Upper Threshold	:CALCulate:CWLan:EVM:BURSt:THReshold:UPPer	List:Amplitude[36]
TOSP Limit Level	:CALCulate:CWLan:TOSPectrum:LIMit:DATA	List:Amplitude[5]
Current View	:DISPlay:CWLan:VIEW:SELect	PARameter
Auto Scaling	:DISPlay:CWLan:VIEW1:WINDow:TRACe:X:SCALe:COUPle	On
X Scale/Div	:DISPlay:CWLan:VIEW1:WINDow:TRACe:X:SCALe:PDIVision	100.00 µs
X Ref	:DISPlay:CWLan:VIEW1:WINDow:TRACe:X:SCALe:RLEVel	0.0000 s
XRefPosition_RfEnv	:DISPlay:CWLan:VIEW1:WINDow:TRACe:X:SCALe:RPOSition	Left
YAutoScale_RfEnv	:DISPlay:CWLan:VIEW1:WINDow:TRACe:Y:SCALe:COUPle	Off
Scale/Div	:DISPlay:CWLan:VIEW1:WINDow:TRACe:Y:SCALe:PDIVision	10.00 dB
YRefLevel_RfEnv	:DISPlay:CWLan:VIEW1:WINDow:TRACe:Y:SCALe:RLEVel	10.00 dBm
YRefPosition_RfEnv	:DISPlay:CWLan:VIEW1:WINDow:TRACe:Y:SCALe:RPOSition	TOP
Arrival Time Uncertainty	:SENSe:CWLan:CAPTure:ATUNcertain	0.00 s
Burst Attenuation	:SENSe:CWLan:CAPTure:BURSt:ATTenuation	List:Amplitude[36]
Burst Frequency	:SENSe:CWLan:CAPTure:BURSt:FREQuency	List:Frequency[36]
Burst Length	:SENSe:CWLan:CAPTure:BURSt:LOAD	List:Time[36]
Burst Count	:SENSe:CWLan:CAPTure:BURSt:NUMBer	1
Burst Prefix	:SENSe:CWLan:CAPTure:BURSt:PREFix	List:Time[36]
Burst suffix	:SENSe:CWLan:CAPTure:BURSt:SUFFix	List:Time[36]
BurstType	:SENSe:CWLan:CAPTure:BURSt:TYPe	STATic
Capture Offset	:SENSe:CWLan:CAPTure:OFFSet	0.00 s
Mod Accuracy Start Burst	:SENSe:CWLan:EVM:BURSt:STARt	1
Mod Accuracy Stop Burst	:SENSe:CWLan:EVM:BURSt:STOP	1
Mod Accuracy Chip Rate	:SENSe:CWLan:EVM:CHPRate	11.000 MHz
Mod Accuracy Clock Adjust	:SENSe:CWLan:EVM:CLKadj	0.000
Mod Accuracy Mod Format	:SENSe:CWLan:EVM:DEMod	AUTO
ModAccuracyOn	:SENSe:CWLan:EVM:ENABle	On
Mod Accuracy EqFilter Length	:SENSe:CWLan:EVM:EQUalizer:LENGth	21
Mod Accuracy EqFilter On/Off	:SENSe:CWLan:EVM:EQUalizer:STATe	Off
Mod Accuracy Equalizer Training	:SENSe:CWLan:EVM:EQUalizer:TRAining	SEQ

Key Path View/Display

Initial S/W Revision A.02.00