

N9073A XFP Combined W-CDMA Measurement Application

User's and Programmer's Reference

This manual provides documentation for the following X-Series Analyzers:

**MXA Signal Analyzer N9020A
EXA Signal Analyzer N9010A**



Agilent Technologies

Manufacturing Part Number: N9073-90012

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1 Introduction

This chapter provides overall information on the Agilent N9073A XFP Combined W-CDMA Measurement Application and describes the measurements made by the analyzer. Installation instructions for adding this option to your analyzer are provided in this section, in case you purchased this option separately.

What Does the Agilent N9073A Combined W-CDMA Measurement Application Do?

The N9073A XFP Combined W-CDMA is a full-featured W-CDMA (3GPP) signal analyzer that can help determine if a W-CDMA modulated source or transmitter is working correctly.

The N9073A XFP adds the Combined W-CDMA measurement and a List Power Step measurement to the standard N9073A W-CDMA measurement application. Combined WCDMA is a special measurement for manufacturing of WCDMA devices. The aim of this measurement is to optimize measurement speed. Some measurements are combined into a single package to prevent time consuming measurement switching. In addition to this, ACP can be measured simultaneously with EVM measurements.

- The N9073A Combined W-CDMA measurement provides:
 - List Power Step measurement
 - Modulation Accuracy (Rho)
 - QPSK EVM
 - ACP
 - Triggering
 - Time Gating

This manual is intended to supplement the standard N9073A W-CDMA User's and Programmer's Reference and Help. Only features specific to the N9073A XFP Combined W-CDMA Measurement Application are documented here.

Installing Application Software

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

So when you purchase an application, you will receive an entitlement certificate that is used to obtain a license key for that particular measurement application. Enter the license key that you obtain into the N9020A Signal Analyzer to activate the new measurement application. See below for more information.

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

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

Viewing a License Key

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

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

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

C:\Programing Files\Agilent\Licensing

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

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

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

Installing a license key can also be done manually using the license management application in the instrument. It is found through the instrument front panel keys at **System, Licensing. . .**, or internally at C:\Programming Files\Agilent\Licensing.

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

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

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

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

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

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

Single-Acquisition Combined W-CDMA Measurement

Combined WCDMA is a special measurement for manufacturing of WCDMA devices. The aim of this measurement is to optimize measurement speed. Some measurements are combined into a single package to prevent time consuming measurement switching. In addition to this, ACP can be measured simultaneously with EVM measurements. The following measurements are supported: Modulation Accuracy (Rho), QPSK EVM, ACP.

Combined WCDMA

Single Acquisition Combined WCDMA measurement is a special measurement for manufacturing of WCDMA devices. The aim of this measurement is to optimize measurement speed. Some measurements are combined into a single package to prevent time consuming measurement switching. In addition to this, ACP can be measured simultaneously with EVM measurements.

Currently, the following measurements are supported:

Modulation Accuracy (Rho)

QPSK EVM

Adjacent Channel Power (ACP)

For more information on Meas Setup see:

Section Parameter List, Parameter List

Key Path	Meas
Instrument S/W Revision	A.01.60 or later

Remote Commands

:CONFigure: CWCDma
:CONFigure: CWCDma: NDEFault
:FETCh: CWCDma [n] ?
:INITiate: CWCDma
:MEASure: CWCDma [n] ?
:READ: CWCDma [n] ?

Remote SCPI Results

n	Results Returned
0	Returns unprocessed I/Q trace data of Capture Interval, as a series of trace point values. The I values are listed first in each pair, using the 0 through even-indexed values. The Q values are the odd-indexed values.

n

Results Returned

1 (or not specified)

Returns scalar results.

Total results length and the returned values depend on the number of enabled frequencies and Result Selection. Results only for enabled frequencies are returned. The length becomes shorter if some results are enabled.

Note that the condition where no result is set to invisible and multiple frequencies are enabled is assumed here.

Scalar results consist of following results blocks:

1. Rho (or QPSK EVM) results for Frequency 1
2. ACP results for Frequency 1
3. Rho (or QPSK EVM) results for Frequency 2
4. ACP results for Frequency 2
5. Rho (or QPSK EVM) results for Frequency 3

...

Rho results block - consists of the following values (first index of the block is denoted by (R)):

(R). RMS EVM is a floating point number (in percent) of EVM

(R)+1. Peak EVM is a floating point number (in percent) of the peak EVM

(R)+2. Magnitude error is a floating point number (in percent) of the average magnitude error

(R)+3. Phase error is a floating point number (in degree) of the average phase error

(R)+4. I/Q origin offset is a floating point number (in dB) of the I and Q error (magnitude squared) offset from the origin

(R)+5. Frequency error is a floating point number (in Hz) of the frequency error in the measured signal

(R)+6. Rho is a floating point number of Rho

(R)+7. Peak Code Domain Error is a floating point number (in dB) of the Peak Code Domain Error relative to the mean power

(R)+8. Peak Code Domain Error Channel Number is the channel number in which the peak code domain error is detected.

(R)+9. Number of active channels

(R)+10. Time offset is a floating point number (in chips) of the pilot phase timing from the acquisition trigger point.

(R)+11. CPICH power over a slot is a floating point number (in dB) of the CPICH power over a measurement slot. In the MS mode, the value returned is -999.

n

Results Returned

1 (or not
specified)
Continued

(R)+12. Total power over a slot is a floating point number (in dBm) of the total RF power over a measurement slot.

(R)+13. First Slot Number is an integer number of the first slot in Capture Interval. This is not averaged even if the averaging function is On. It is always the last cycle of the measurement.

(R)+14. DPCCH Slot Format: (floating) If Sync Type is DPCCH, the DPCCH slot format value used for synchronization is returned.

0.0: Slot Format 0

1.0: Slot Format 1

2.0: Slot Format 2

3.0: Slot Format 3

4.0: Slot Format 4

5.0: Slot Format 5

- If Sync Type is PRACH, the value returned is –999.0.

- In BTS mode, the value returned is –999.0.

(R)+15. Preamble Signature: (floating)

- BTS mode

The returned value is always –999.0.

- MS mode

In Preamble Signature auto-detection mode, the detected signature code number (from 0.0 to 15.0) is returned when the Sync Type is PRACH Message.

In Preamble Signature manual setting mode, the returned value is the same as the parameter setting. When the Sync Type is not PRACH Message, the returned value is –999.0.

QPSK EVM results block – consists of the following values (first index of the block is denoted by (Q)):

(Q). RMS EVM is a floating point number (in percent) of EVM.

(Q)+1. Peak EVM is a floating point number (in percent) of peak EVM.

(Q)+2. Magnitude Error is a floating point number (in percent) of magnitude error.

(Q)+3. Phase Error is a floating point number (in degrees) of phase error.

(Q)+4. Frequency Error is a floating point number (in Hz) of the frequency error in the measured signal.

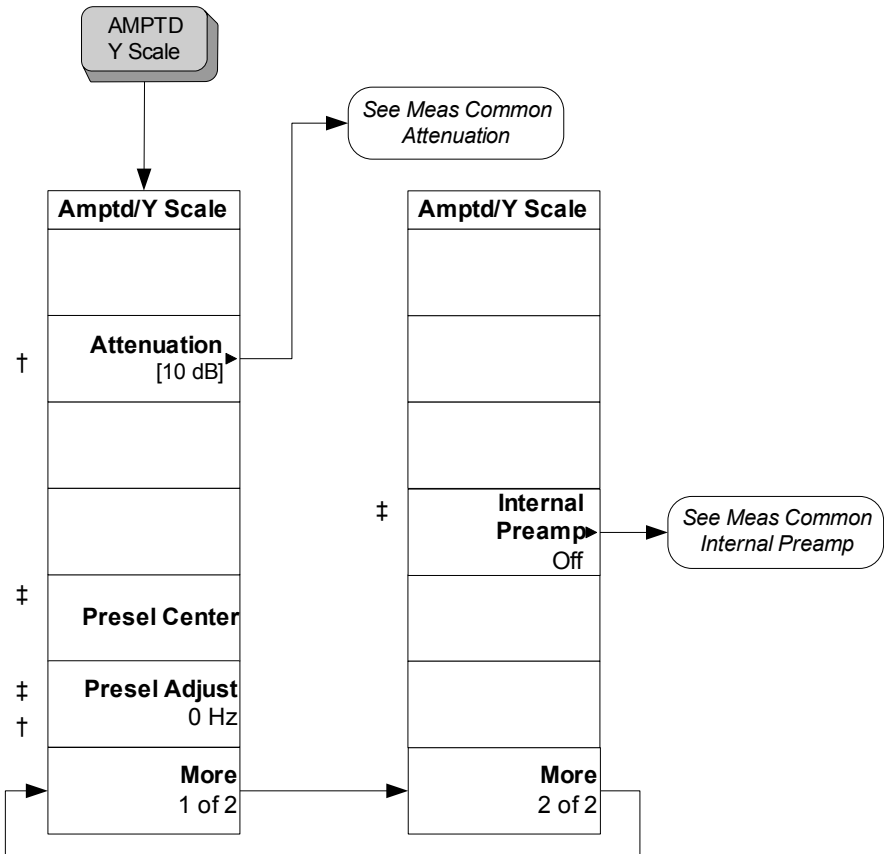
(Q)+5. I/Q Origin Offset is a floating point number (in dB) of the I and Q error (magnitude squared) offset from the origin.

n	Results Returned
1 (or not specified) Continued	ACP results block - consists of the following values (first index of the block is denoted by (A)): (A). Carrier Power (dBm) (A)+1. Lower Offset Relative Power (dB) (A)+2. Lower Offset Absolute Power (dBm) (A)+3. Upper Offset Relative Power (dB) (A)+4. Upper Offset Absolute Power (dBm)
2	Returns information about scalar results (n = 1). Total results length and the returned values depend on the number of enabled frequencies. Information only for enabled frequencies is returned. 0. Number of Enabled Frequencies 1. First Index of Index List for Frequency 1 (zero-based) 2. First Index of Index List for Frequency 2 (zero-based) ... Index List consists of following values (first index of the block is denoted by (F)): (F). First Index of Rho results in scalar results (zero-based) (F)+1. First Index of QPSK EVM results in scalar results (zero-based) (F)+2. First Index of ACP results in scalar results (zero-based) If there are no results for the measurement, -999 is returned as index. For example, "2, 3, 6, 0, -999, 15, 18, -999, 33" means: - There are 2 enabled frequencies. - Index List block for Frequency 1 starts at index 3 in this list. - Index List block for Frequency 2 starts at index 6 in this list. - Rho results for Frequency 1 start at index 0 in scalar results (n = 1). - There is no QPSK EVM result for Frequency 1 in scalar results (n = 1). - ACP results for Frequency 1 start at index 15 in scalar results (n = 1). - Rho results for Frequency 2 start at index 18 in scalar results (n = 1). - There is no QPSK EVM result for Frequency 2 in scalar results (n = 1). - ACP results for Frequency 2 start at index 33 in scalar results (n = 1).

Amplitude (AMPTD) Y Scale

There is no functionality unique to this measurement.

For more information see your W-CDMA User's and Programmers reference or Help.



Attenuation

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

See Attenuation under the AMPTD Y Scale section for more information.

Presel Center

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

See Presel Center under the AMPTD Y Scale section for more information.

Presel Adjust

Allows you to manually adjust the preselector filter frequency to optimize its response to the signal of interest. This function is only available when Presel Center is available. See Presel Adjust under the AMPTD Y Scale section for more information.

Internal Preamp

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

BW

There are no menu keys available in BW menu.

Marker

There are no menu keys available in Marker menu.

Marker Fctn

There are no menu keys available in Marker Function menu.

Marker > (Marker To)

There are no menu keys available in Marker To.

Meas Setup

RRC Filter Control

Allows you to change the status (ON/OFF) of the Root Raised Cosine (RRC) filter. This ON/OFF state change involve measurement restart.

Mode	WCDMA
Remote Command	[:SENSe]:CWCDma:FILTer[:RRC][:STATe] OFF ON 0 1 [:SENSe]:CWCDma:FILTer[:RRC][:STATe]?
Example	CWCD:FILT ON CWCD:FILT?
Preset	ON
State Saved	Saved in instrument state.
Instrument S/W Revision	A.01.60 or later

Filter Alpha

Specifies the alpha value of the Root Raised Cosine (RRC) filter.

Mode	WCDMA
Remote Command	[:SENSe]:CWCDma:FILTer[:RRC]:ALPHA <real> [:SENSe]:CWCDma:FILTer[:RRC]:ALPHA?
Example	CWCD:FILT:ALPH 0.3 CWCD:FILT:ALPH?
Preset	0.22
State Saved	Saved in instrument state.
Min	0.01
Max	0.50
Test MIN/MAX/DEF	Yes

Test UP/DOWN	0.01
Instrument S/W Revision	A.01.60 or later

IF Gain

IF Gain Auto

Activates the auto rules for IF Gain.

Remote Command:	[:SENSe] :CWCDma : IF : GAIN : AUTO [: STATE] OFF ON 0 1 [:SENSe] :CWCDma : IF : GAIN : AUTO [: STATE] ?
Example:	CWCD : IF : GAIN : AUTO OFF CWCD : IF : GAIN : AUTO ?
Dependencies/Couplings:	When either the auto attenuation works (for example, with the electrical attenuator) or optimize mechanical attenuator range is requested, the IF Gain setting is changed according to the following rule. 'Auto' sets IF Gain to 'High Gain' under any of the following conditions: the input attenuator is set to 0 dB, the preamp is turned on, or the Max Mixer Level is 20 dBm or lower. For other settings, 'Auto' sets IF Gain to 'Low Gain'.
Preset:	OFF
State Saved:	Saved in instrument state.
Instrument S/W Revision:	A.01.60 or later

IF Gain State

Selects the range of IF gain.

Remote Command:	[:SENSe] :CWCDma : IF : GAIN [: STATE] ON OFF 1 0 [:SENSe] :CWCDma : IF : GAIN [: STATE] ?
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Example:	CWCD:IF:GAIN OFF CWCD:IF:GAIN?
Notes:	ON = high gain OFF = low gain
Dependencies/Couplings:	When either the auto attenuation works (for example, with the electrical attenuator) or optimize mechanical attenuator range is requested, the IF Gain setting is changed according to the following rule. 'Auto' sets IF Gain to 'High Gain' under any of the following conditions: the input attenuator is set to 0 dB, the preamp is turned on, or the Max Mixer Level is 20 dBm or lower. For other settings, 'Auto' sets IF Gain to 'Low Gain'.
Preset:	OFF
State Saved:	Saved in instrument state.
Instrument S/W Revision:	A.01.60 or later

Capture Setup

Step Capture Interval

Sets capture time of a step.

See Algorithm Overview for detail.

Mode	WCDMA
Remote Command	[:SENSe]:CWCDma:CAPTure[:TIME] <time> [:SENSe]:CWCDma:CAPTure[:TIME]?
Example	CWCD:CAPT 5ms CWCD:CAPT?
Notes	The following condition must be met for all enabled measurements: $(\text{Calculation Length}) + (\text{Calculation Offset}) \leq (\text{Step Capture Interval})$ Any value lower than $(\text{Calculation Length}) + (\text{Calculation Offset})$ is clipped to $(\text{Calculation Length}) + (\text{Calculation Offset})$. When Calculation Length or Calculation Offset is increased, this parameter is adjusted only if the condition is not met.

Preset	5ms
State Saved	Saved in instrument state.
Min	9.10230e-05
Max	0.1
Test MIN/MAX/DEF	No
Test UP/DOWN	0.01
Instrument S/W Revision	A.01.60 or later

Gate Setup

Gate Source

Sets source of gate. If this is set to IMMEDIATE, next capture starts immediately after gate recovery time is elapsed. If not, it starts to wait for gate condition to be met after gate recovery time is elapsed and capture starts after the condition is met.

See Algorithm Overview for detail.

Mode	WCDMA
Remote Command	[:SENSe] :CWCDma :GATE :SOURce IMMediate EXTeRnal1 EXTeRnal2 RFBurst FRAME [:SENSe] :CWCDma :GATE :SOURce?
Example	CWCD:GATE:SOUR RFB CWCD:GATE:SOUR?
Preset	IMMediate
State Saved	Saved in instrument state.
Range	Immediate Video External1 External2 RF Burst Frame
Instrument S/W Revision	A.01.60 or later

Gate Recovery Time

Sets recovery time of gate. It is needed to wait for waveform to be stabilized after frequency

hopping.
See Algorithm Overview for detail.

Remote Command:	<code>[:SENSe]:CWCDma:GATE:RTIME <time></code> <code>[:SENSe]:CWCDma:GATE:RTIME?</code>
Example:	<code>CWCD:GATE:RTIM 500e-6</code> <code>CWCD:GATE:RTIM?</code>
Preset:	1ms
State Saved:	Saved in instrument state.
Min:	1us
Max:	10ms
Test MIN/MAX/DEF:	Yes
Test UP/DOWN:	10us
Instrument S/W Revision:	A.01.60 or later

Frequency List Setup

Frequency List

Sets list of frequencies to be measured.

Mode	WCDMA
Remote Command	<code>[:SENSe]:CWCDma:LIST:FREQuency <freq>, ...</code> <code>[:SENSe]:CWCDma:LIST:FREQuency</code>
Example	<code>CWCD:LIST:FREQ 900e6,1.0e9,1.1e9,0,0,0,0,0,0,0,0</code> <code>CWCD:LIST:FREQ?</code>

Notes	The length of returned list is fixed at 12, but shorter list is acceptable. If the number of received items is less than 12, unsent values are not changed. The Center Frequency setting under Freq/Channel front panel key or [:SENSe]:FREQuency:CENTer overwrites the first frequency in this list. CAUTION: When list acquisition is performed, the maximum frequency is 3.6GHz even they are all the same frequency. When only the first list is used (see [:SENSe]:CWCDma:LIST:STATe), there is no limitation.
Preset	1.0e9,1.0e9,1.0e9,1.0e9,1.0e9,1.0e9,1.0e9,1.0e9,1.0e9,1.0e9,1.0e9,1.0e9
State Saved	Saved in instrument state.
Min	-79.999995 MHz
Max	Hardware Dependent: Same as Center Frequency
Test MIN/MAX/DEF	No
Test UP/DOWN	Yes
Instrument S/W Revision	A.01.60 or later

State List

Sets list of states. If the state of the element is false, the element is skipped.

Mode	WCDMA
Remote Command	<pre>[:SENSe] :CWCDma:LIST:STATe ON OFF 1 0, ...</pre> <pre>[:SENSe] :CWCDma:LIST:STATe</pre>
Example	<pre>CWCD:LIST:STAT 1,1,0,0,0,0,0,0,0,0,0,0</pre> <pre>CWCD:LIST:STAT?</pre>
Notes	The length of returned list is fixed at 12, but shorter list is acceptable. If the number of received items is less than 12, unsent values are not changed. First element is fixed at ON.
Preset	1,0,0,0,0,0,0,0,0,0,0,0
State Saved	Saved in instrument state.

Instrument S/W Revision A.01.60 or later

Rho Related Setting Commands

Measurement Enable/Disable

Allows you to enable or disable RHO measurement.

Mode	WCDMA
Remote Command	[:SENSe]:CWCDma:RHO[:ENABle] OFF ON 0 1 [:SENSe]:CWCDma:RHO[:ENABle]?
Example	CWCD:RHO OFF CWCD:RHO?
Preset	ON
State Saved	Saved in instrument state.
Range	On Off
Instrument S/W Revision	A.01.60 or later

Rho Calculation Length

Sets calculation length of Rho measurement.

See Algorithm Overview for detail.

Mode	WCDMA
Remote Command	[:SENSe]:CWCDma:RHO:SWEep:LENGth <time> [:SENSe]:CWCDma:RHO:SWEep:LENGth?
Example	CWCD:RHO:SWE:LENG 5ms CWCD:RHO:SWE:LENG?
Preset	3.383334ms

State Saved	Saved in instrument state.
Min	3.383334ms
Max	22.716667ms
Test MIN/MAX/DEF	Yes
Test UP/DOWN	0.0001
Instrument S/W Revision	A.01.60 or later

Rho Calculation Offset

Sets calculation offset of Rho measurement. The first part of a step can be affected by a frequency hopping. Specified length of the first portion is discarded if non-zero value is set.

See Algorithm Overview for detail.

Mode	WCDMA
Remote Command	[:SENSe] :CWCDma:RHO:SWEep:OFFSet <time> [:SENSe] :CWCDma:RHO:SWEep:OFFSet?
Example	CWCD:RHO:SWE:OFFS 100us CWCD:RHO:SWE:OFFS?
Preset	0.0
State Saved	Saved in instrument state.
Min	0.0
Max	18.838866ms
Test MIN/MAX/DEF	Yes
Test UP/DOWN	0.0001
Instrument S/W Revision	A.01.60 or later

Rho Result Selection

Sets the composition of Rho result block in scalar results. If an item is disabled (off), the item is not shown and not contained in remote results.

The number and the order of this list correspond to Rho result block in remote result (n =

1).

Mode	WCDMA
Remote Command	[:SENSe]:CWCDma:RHO:RESult ON OFF 0 1, ... [:SENSe]:CWCDma:RHO:RESult?
Example	CWCD:RHO:RES 1,0,0,0,0,0,0,0,0,0,0,0,0,0,0 CWCD:RHO:RES?
Preset	1,1,1,1,1,1,1,1,1,1,1,1,1,1,1
State Saved	Saved in instrument state.
Instrument S/W Revision	A.01.60 or later

Sync Type

Sync Type BTS Enables you to select the channel to synchronize with, and to set features, such as Symbol Rate, that may affect synchronization. You can select from the following types of channels and features listed in the menu:

CPICH - Synchronize with the common pilot channel (CPICH).

SCH - Synchronize with the synchronization channel (SCH).

Symbol Based - Allows you to access the menu that allows you to select the code symbol to synchronize with.

Symbol Rate - Allows you to set the symbol rate, ranging from 7.5 to 960 ksps. The parameter automatically sets the maximum value for Code Number when appropriate.

Code Number - Allows you to set the code number. The range is 0 to 511, depending on the Symbol Rate setting.

Antenna-2 CPICH - Allows you to synchronize with the STTD Antenna-2 common pilot channel.

STTD Diff - Allows you to synchronize to the common pilot channel at STTD antenna-1 and antenna-2 to make Diversity Time Error measurements.

TSTD SCH Antenna1 – Allows you to synchronize the antenna1 of TSTD SCH.

TSTD SCH Antenna2 – Allows you to synchronize the antenna2 of TSTD SCH.

Mode	WCDMA
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Remote Command	[:SENSe] :CWCDma :RHO :SYNC [:BTS] CPICH SCH SYMBol STTD A2CPICH A1SCH A2SCH [:SENSe] :CWCDma :RHO :SYNC [:BTS] ?
Example	CWCD:RHO:SYNC SCH CWCD:RHO:SYNC?
Notes	This command is effective when [:SENSe]:RADio:DEVice is set to BTS.
Dependencies/Couplings	The SYMBol selection is synchronized to the code symbol specified by [:SENSe]:CWCD:RHO:SYNC:SYMBol:SRATe and [:SENSe]:CWCD:RHO:SYNC:SYMBol:SPRead.
Preset	CPICH
State Saved	Saved in instrument state.
Instrument S/W Revision	A.01.60 or later

Synchronization Symbol Rate [BTS only] Sets the symbol rate of the code symbol to synchronize with. The parameter automatically sets the maximum value for the Code Number when appropriate. This command is currently available only for BTS.

Mode	WCDMA
Remote Command	[:SENSe] :CWCDma :RHO :SYNC :SYMBol :SRATe <integer> [:SENSe] :CWCDma :RHO :SYNC :SYMBol :SRATe?
Example	CWCD:RHO:SYNC:SYMB:SRAT 15000 CWCD:RHO:SYNC:SYMB:SRAT?
Notes	This command is effective when [:SENSe]:RADio:DEVice is set to BTS, and [:SENSe]:CWCD:RHO:SYNC[:BTS] is set to SYMBol.
Preset	7500
State Saved	Saved in instrument state.
Range	7500 15000 30000 60000 120000 240000 480000 960000
Test MIN/MAX/DEF	Yes
Test MIN/MAX/DEF	No
Test UP/DOWN	7500, 15000, 30000, 60000, 120000, 240000, 480000, 960000
Instrument S/W Revision	A.01.60 or later

Synchronization Code Number [BTS only] Sets the spread code number of the code symbol to synchronize with. The range depends on the Symbol Rate setting. This command is available only for BTS.

Mode	WCDMA
Remote Command	<code>[:SENSe]:CWCDma:RHO:SYNC:SYMBol:SPRead <integer></code> <code>[:SENSe]:CWCDma:RHO:SYNC:SYMBol:SPRead?</code>
Example	<code>CWCD:RHO:SYNC:SYMB:SPR 3</code> <code>CWCD:RHO:SYNC:SYMB:SPR?</code>
Notes	This command is effective when <code>[:SENSe]:RADio:DEvice</code> is set to BTS, and <code>[:SENSe]:CWCDma:RHO:SYNC[:BTS]</code> is set to SYMBol.
Dependencies/Couplings	See Notes
Preset	1
State Saved	Saved in instrument state.
Min	0
Max	511, when <code>[:SENSe]:CWCDma:RHO:SYNC:SYMBol:SRATe = 7500</code> 255, when <code>[:SENSe]:CWCDma:RHO:SYNC:SYMBol:SRATe = 15000</code> 127, when <code>[:SENSe]:CWCDma:RHO:SYNC:SYMBol:SRATe = 30000</code> 63, when <code>[:SENSe]:CWCDma:RHO:SYNC:SYMBol:SRATe = 60000</code> 31, when <code>[:SENSe]:CWCDma:RHO:SYNC:SYMBol:SRATe = 120000</code> 15, when <code>[:SENSe]:CWCDma:RHO:SYNC:SYMBol:SRATe = 240000</code> 7, when <code>[:SENSe]:CWCDma:RHO:SYNC:SYMBol:SRATe = 480000</code> 3, when <code>[:SENSe]:CWCDma:RHO:SYNC:SYMBol:SRATe = 960000</code>
Test MIN/MAX/DEF	Yes
Instrument S/W Revision	A.01.60 or later

Sync Type MS Accesses a menu that enables you to select the channel to synchronize with. You can select from the following types listed in the menu:

DPCCh - Synchronize to DPCCH and the Slot Format which is specified by
`[ :SENSe]:CWCDma:RHO:SFOFormat:MS`

PMESsage - Synchronize to PRACH Message and the Slot Format which is specified by
`[ :SENSe]:CWCDma:RHO:PRACH:SIGNature` and
`[ :SENSe]:CWCDma:RHO:SFOFormat:MS`.

Mode	WCDMA
Remote Command	[:SENSe] :CWCDma :RHO :SYNC :MS DPCCh PMESsage [:SENSe] :CWCDma :RHO :SYNC :MS?
Example	CWCD:RHO:SYNC:MS DPCCh CWCD:RHO:SYNC:MS?
Notes	This command is effective when [:SENSe]:RADio:DEVIce is set to MS.
Preset	DPCCh
State Saved	Saved in instrument state.
Instrument S/W Revision	A.01.60 or later

P Scramble Code [BTS only]

Set the BTS primary scramble code for synchronization. The BTS scramble code number (Down Link) is determined by the “Primary Scramble Code”, “Scramble Code Offset” and “Scramble Code Type”.

The following information is an excerpt from TS25.213 Section 5.2.2 Scramble Code.

A total of $218-1 = 262,143$ scrambling codes, numbered $0 \dots 262,142$ can be generated. However, not all the scrambling codes are used. The scrambling codes are divided into 512 sets, each consisting of a primary scrambling code and 15 secondary scrambling codes.

The primary scrambling codes consist of scrambling codes $n=16*i$ where $i=0 \dots 511$. The i :th set of secondary scrambling codes consists of scrambling codes $16*i+k$, where $k=1 \dots 15$.

There is a one-to-one mapping between each primary scrambling code and the 15 secondary scrambling codes in a set such that i :th primary scrambling code corresponds to i :th set of secondary scrambling codes.

Hence, according to the above, scrambling codes $k = 0, 1, \dots, 8191$ are used. Each of these codes is associated with a left alternative scrambling code and a right alternative scrambling code that may be used for compressed frames. The left alternative scrambling code corresponding to scrambling code k is scrambling code number $k + 8192$, while the right alternative scrambling code corresponding to scrambling code k is scrambling code number $k + 16384$. The alternative scrambling codes can be used for compressed frames. In this case, the left alternative scrambling code is used if $n < SF/2$, and the right alternative scrambling code is used if $n \geq SF/2$, where cch, SF, n is the channelization code used for non-compressed frames. The usage of an alternative scrambling code for compressed frames is signalled by higher layers for each physical channel respectively.

The Primary Scramble Code corresponds to i ($i=0 \dots 511$), the Scramble Code Offset

corresponds to k (k= 1 ... 15: Secondary Scramble Code, 0: Primary Scramble Code) and the Scramble Code Type Left and Right correspond to +8192 and +16384 offsets respectively.

If the Device is set to BTS, allows you to enter a numeric value for the primary scramble code. The range is 0 to 511.

If the Device is set to MS, this label changes to Slot Format to define the DPCCH pilot pattern to synchronize with. It allows you to enter either 0 or 2 slot formats.

Mode	WCDMA
Remote Command	<code>[:SENSe] :CWCDma:RHO:SYNC:SCRamble[:BTS] <integer></code> <code>[:SENSe] :CWCDma:RHO:SYNC:SCRamble[:BTS] ?</code>
Example	CWCD:RHO:SYNC:SCR 100 CWCD:RHO:SYNC:SCR?
Notes	This command is effective when [:SENSe]:RADio:DEvice is set to BTS.
Preset	0
State Saved	Saved in instrument state.
Min	0
Max	511
Test MIN/MAX/DEF	Yes
Instrument S/W Revision	A.01.60 or later

Slot Format [MS only]

Defines the uplink DPCCH pilot pattern to synchronize with. The command is effective when the [:SENSe]:CWCDma:RHO:SYNC:MS command is set to DPCCh.

(0A, 0B, 2A, 2B, 5A and 5B are not supported, because the compressed mode is not supported.)

Mode	WCDMA
Remote Command	<code>[:SENSe] :CWCDma:RHO:SFORmat:MS SF0 SF1 SF2 SF3 SF4 SF5</code> <code>[:SENSe] :CWCDma:RHO:SFORmat:MS?</code>

Example	CWCD:RHO:SFOR:MS SF0 CWCD:RHO:SFOR:MS?
Notes	This command is effective when [:SENSe]:RADio:DEVice is set to MS, and [:SENSe]:CWCDma:RHO:SYNC:MS is set to DPCCCh.
Preset	SF0
State Saved	Saved in instrument state.
Range	SF0 SF1 SF2 SF3 SF4 SF5
Instrument S/W Revision	A.01.60 or later

Preamble Signature [MS only]

Sets the PRACH Preamble Signature number for PRACH Message detection. Based on this value, the code allocation of the PRACH message control part is calculated. This command is effective when the [:SENSe]:CWCDma:RHO:SYNC:MS command is set to PMESsage (PRACH Message).

PRACH message (Control) has only Slot Format #0. The field lengths are defined in the table below. Demod attribute information is colored according to the given Slot Format parameter. Using input parameter Slot Format #i, bit data is colored accordingly (for example, Npilot and NTFCI).

Table 9-1 PRACH message Control field Information (TS25.211 V.3.9.0)

Slot Format #i	Channel Bit Rate (kbps)	Channel Symbol Rate (ksps)	SF	Bits/ Frame	Bits/ Slot	Npilot	NTFC I
0	15	15	256	150	10	8	2

Select Auto or Man (Manual). Auto corresponds to “ON” for the [:SENSe]:CWCDma:RHO:PRACH:SIGNature:AUTO command. When Auto is selected, it searches and synchronizes the PRACH Message control part automatically. The code for the control part is assigned according to the PRACH Preamble Signature number. It can find the code number for the control part from 16 possible cases. But it takes more time than manual setting. “---” is shown initially. When Man is selected, it synchronizes with the code specified by the Preamble Signature.

The value is set at its auto number and “---” is replaced with the detected number, if PRACH Search is set to Auto and PRACH Message sync is done (PRACH Message control part is detected) successfully. Otherwise the value is not changed.

[Note:] This function does not check the Preamble Signature itself. Instead, using this information, it identifies the code location for the PRACH Message control part. The relationship between “Preamble Signature” and “code location for PRACH Message control part” is a one-to-one correspondence.

Mode	WCDMA
Remote Command	<pre>[:SENSe]:CWCDma:RHO:PRACH:SIGNature <integer> [:SENSe]:CWCDma:RHO:PRACH:SIGNature? [:SENSe]:CWCDma:RHO:PRACH:SIGNature:AUTO OFF ON 0 1 [:SENSe]:CWCDma:RHO:PRACH:SIGNature:AUTO?</pre>
Example	<pre>CWCD:RHO:PRAC:SIGN 3 CWCD:RHO:PRAC:SIGN? CWCD:RHO:PRAC:SIGN:AUTO OFF CWCD:RHO:PRAC:SIGN:AUTO?</pre>
Notes	This command is effective when [:SENSe]:RADio:DEvice is set to MS, and [:SENSe]:CWCDma:RHO:SYNC:MS is set to PMESsage. Set Signature Auto mode ON for PRACH Preamble detection.
Preset	<pre>0 ON</pre>
State Saved	Saved in instrument state.
Min	0
Max	15
Test MIN/MAX/DEF	Yes
Instrument S/W Revision	A.01.60 or later

Scramble Code Offset [BTS only]

Sets the number of scramble code offsets needed to make the modulation accuracy measurement.

Mode	WCDMA
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Remote Command	[:SENSe]:CWCDma:RHO:SYNC:SCRamble[:BTS]:OFFSet <integer> [:SENSe]:CWCDma:RHO:SYNC:SCRamble[:BTS]:OFFSet?
Example	CWCD:RHO:SYNC:SCR:OFFS 5 CWCD:RHO:SYNC:SCR:OFFS?
Notes	This command is effective when [:SENSe]:RADio:DEVice is set to BTS.
Preset	0
State Saved	Saved in instrument state.
Range	0 to 15 (0 for the primary scramble code; 1 to 15 for the secondary scramble code)
Test MIN/MAX/DEF	Yes
Instrument S/W Revision	A.01.60 or later

Scramble Code [MS only]

Set the MS scramble code for synchronization.

Mode	WCDMA
Remote Command	[:SENSe]:CWCDma:RHO:SYNC:SCRamble:MS <integer> [:SENSe]:CWCDma:RHO:SYNC:SCRamble:MS?
Example	CWCD:RHO:SYNC:SCR:MS 10000000 CWCD:RHO:SYNC:SCR:MS?
Notes	This command is effective when [:SENSe]:RADio:DEVice is set to MS.
Preset	0 (0x0)
State Saved	Saved in instrument state.
Range	0 to 16777215 (0x0 to 0xFFFFFFFF; 24 bits)
Test MIN/MAX/DEF	Yes
Test UP/DOWN	1
Instrument S/W Revision	A.01.60 or later

Scramble Code Type [BTS only]

Sets the BTS primary scramble code type for synchronization.

Enables you to set the scramble code type to either Std (standard), Left, or Right to make the modulation accuracy measurement.

LEFT – the left alternative scrambling code whose number is the primary scramble code number + 8192 is used.

RIGHT – the right alternative scrambling code whose number is the primary scrambling code number + 16384 is used.

STANDARD – the standard scrambling code whose number is the primary scrambling code number is used.

Mode	WCDMA
Remote Command	[:SENSe] :CWCDma:RHO:SYNC:SCRamble [:BTS] :TYPE LEFT RIGHT STANDARD [:SENSe] :CWCDma:RHO:SYNC:SCRamble [:BTS] :TYPE?
Example	CWCD:RHO:SYNC:SCR:TYPE LEFT
Notes	This command is effective when [:SENSe]:RADio:DEvIce is set to BTS.
Preset	STANDARD
State Saved	Saved in instrument state.
Instrument S/W Revision	A.01.60 or later

Symbol Boundary [BTS only]

The symbol boundary detection modes are used to make the modulation accuracy measurement.

AUTO - Sets symbol boundary detection to the automatic mode. Various code channels are measured and the most appropriate code channel is selected as the reference channel.

The followings are further selection of various numbers of DPCH channels to make the Mod Accuracy Measurement.

TM1D16 - Select this to set the Mod Accuracy Measurement to the Test Model 1 with 16 DPCH channels and 1 S-CCPCH channel.

TM1D32 - Select this to set the Mod Accuracy Measurement to Test Model 1 with 32 DPCH channels and 1 S-CCPCH channel.

TM1D64 - Select this to set the Mod Accuracy Measurement to Test Model 1 with 64 DPCH channels and 1 S-CCPCH channel.

TM2SC - Select this to set the Mod Accuracy Measurement to Test Model 2 with 1 S-CCPCH channel.

TM3D16SC - Select this to set the Mod Accuracy Measurement to Test Model 3 with 16 DPCH channels and 1 S-CCPCH channel.

TM3D32SC - Select this to set the Mod Accuracy Measurement to Test Model 3 with 32 DPCH channels and 1 S-CCPCH channel.

TM4CP - Select this to set the Mod Accuracy Measurement to Test Model 4 with 1 CPICH channel.

TM4 - Select this to set the Mod Accuracy Measurement to Test Model 4 (no CPICH channel).

TM5H2 - Select this to set the Mod Accuracy Measurement to Test Model 5 with 2 HS-PDSCH channels and 6 DPCH channels.

TM5H4 - Select this to set the Mod Accuracy Measurement to Test Model 5 with 4 HS-PDSCH channels and 14 DPCH channels.

TM5H8 - Select this to set the Mod Accuracy Measurement to Test Model 5 with 8 HS-PDSCH channels and 30 DPCH channels.

CUSTom – “Custom” choice provides a flexible way to specify predefined active channels. By choosing it, you can specify a customized list of active channels using the following remote command: Initialize List, Append List and Replace List.

Mode	WCDMA
Remote Command	<pre>[:SENSe] :CWCDma :RHO :SBOundary [:BTS] AUTO TM1D16 TM1D32 TM1D64 TM1D16SC TM1D32SC TM1D64SC TM 2 TM2SC TM3D16 TM3D32 TM3D16SC TM3D32SC TM4 TM4CP TM5H2 TM5H4 TM5H8 CUSTom [:SENSe] :CWCDma :RHO :SBOundary [:BTS] ?</pre>
Example	CWCD:RHO:SBO:BTS TM1D16 CWCD:RHO:SBO:BTS?
Notes	This command is effective when [:SENSe]:RADio:DEVICE is set to BTS.
Preset	AUTO
State Saved	Saved in instrument state.

Range	AUTO TM1D16 TM1D32 TM1D64 TM1D16SC TM1D32SC TM1D64SC TM2 TM2SC TM3D16 TM3D32 TM3D16SC TM3D32SC TM4 TM4CP TM5H2 TM5H4 TM5H8 CUSTom
Instrument S/W Revision	A.01.60 or later

Test Model 1 [BTS only] TS25.141 Table 6.1: Test Model 1 (2002–09 version) (S-CCPCH included)

Type	Number of Channels	Fraction of Power (%)	Level setting (dB)	Channelization Code	Timing offset (x256Tchip)
P-CCPCH+SCH	1	10	–10	1	0
Primary CPICH	1	10	–10	0	0
PICH	1	1.6	–18	16	120
S-CCPCH containing PCH (SF=256)	1	1.6	–18	3	0
DPCH (SF=128)	16/32/64	76.8 in total	see 3GPP TS25.141 Table 6.2	see 3GPP TS25.141 Table 6.2	see 3GPP TS25.141 Table 6.2

Test Model 1 w/16 DPCH w/S-CCPCH [BTS only] TS25.141 Table 6.1: Test Model 1 (2002–09 version) (S-CCPCH included)

Type	Number of Channels	Fraction of Power (%)	Level setting (dB)	Channelization Code	Timing offset (x256Tchip)
P-CCPCH+SCH	1	10	–10	1	0
Primary CPICH	1	10	–10	0	0
PICH	1	1.6	–18	16	120
S-CCPCH containing PCH (SF=256)	1	1.6	–18	3	0

DPCH (SF=128)	16/32/64	76.8 in total	see 3GPP TS25.141 Table 6.2	see 3GPP TS25.141 Table 6.2	see 3GPP TS25.141 Table 6.2
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Test Model 1 w/32 DPCH w/S-CCPCH [BTS only] TS25.141 Table 6.1: Test Model 1 (2002–09 version) (S-CCPCH included)

Type	Number of Channels	Fraction of Power (%)	Level setting (dB)	Channelization Code	Timing offset (x256Tchip)
P-CCPCH+SCH	1	10	−10	1	0
Primary CPICH	1	10	−10	0	0
PICH	1	1.6	−18	16	120
S-CCPCH containing PCH (SF=256)	1	1.6	−18	3	0
DPCH (SF=128)	16/32/64	76.8 in total	see 3GPP TS25.141 Table 6.2	see 3GPP TS25.141 Table 6.2	see 3GPP TS25.141 Table 6.2

Test Model 1 w/64 DPCH w/S-CCPCH [BTS only] TS25.141 Table 6.1: Test Model 1 (2002–09 version) (S-CCPCH included)

Type	Number of Channels	Fraction of Power (%)	Level setting (dB)	Channelization Code	Timing offset (x256Tchip)
P-CCPCH+SCH	1	10	−10	1	0
Primary CPICH	1	10	−10	0	0
PICH	1	1.6	−18	16	120
S-CCPCH containing PCH (SF=256)	1	1.6	−18	3	0
DPCH (SF=128)	16/32/64	76.8 in total	see 3GPP TS25.141 Table 6.2	see 3GPP TS25.141 Table 6.2	see 3GPP TS25.141 Table 6.2

Test Model 2 [BTS only] TS25.141 Table 6.3: Test Model 2 (2002–09 version) (S-CCPCH included)

Type	Number of Channels	Fraction of Power (%)	Level setting (dB)	Channelization Code	Timing offset (x256Tchip)
P-CCPCH+SCH	1	10	−10	1	0
Primary CPICH	1	10	−10	0	0
PICH	1	5	−13	16	120
S-CCPCH containing PCH (SF=256)	1	5	−13	3	0
DPCH (SF=128)	3	2 x 10, 1 x 50	2 x −10, 1 x −3	24, 72, 120	1, 7, 2

Test Model 2 w/S-CCPCH [BTS only] TS25.141 Table 6.: Test Model 2 (2002–09 version) (S-CCPCH included)

Type	Number of Channels	Fraction of Power (%)	Level setting (dB)	Channelization Code	Timing offset (x256Tchip)
P-CCPCH+SCH	1	10	−10	1	0
Primary CPICH	1	10	−10	0	0
PICH	1	5	−13	16	120
S-CCPCH containing PCH (SF=256)	1	5	−13	3	0
DPCH (SF=128)	3	2 x 10, 1 x 50	2 x −10, 1 x −3	24, 72, 120	1, 7, 2

Test Model 3 [BTS only]

Type	Number of Channels	Fraction of Power (%)	Level settings (dB)	Channelization Code	Timing offset (x256Tchip)
		16/32	16/32		

P-CCPCH+SC H	1	12,6/7,9	−9 / −11	1	0
Primary CPICH	1	12,6/7,9	−9 / −11	0	0
PICH	1	5/1.6	−13/−18	16	120
S-CCPCH containing PCH (SF=256)	1	5/1.6	−13/−18	3	0
DPCH (SF=256)	16/32	63,7/80,4 in total	see 3GPP TS25.141 Table 6.5	see 3GPP TS25.141 Table 6.5	see 3GPP TS25.14 1 Table 6.5

Test Model 3 w/16 DPCH w/S-CCPCH [BTS only]

Type	Number of Channels	Fraction of Power (%)	Level settings (dB)	Channelization Code	Timing offset (x256Tchip)
		16/32	16/32		
P-CCPCH+SC H	1	12,6/7,9	−9 / −11	1	0
Primary CPICH	1	12,6/7,9	−9 / −11	0	0
PICH	1	5/1.6	−13/−18	16	120
S-CCPCH containing PCH (SF=256)	1	5/1.6	−13/−18	3	0
DPCH (SF=256)	16/32	63,7/80,4 in total	see 3GPP TS25.141 Table 6.5	see 3GPP TS25.141 Table 6.5	see 3GPP TS25.141 Table 6.5

Test Model 3 w/32 DPCH w/S-CCPCH [BTS only]

Type	Number of Channels	Fraction of Power (%)	Level settings (dB) 16/32	Channelization Code	Timing offset (x256Tchip)
P-CCPCH+SCH	1	12,6/7,9	-9 / -11	1	0
Primary CPICH	1	12,6/7,9	-9 / -11	0	0
PICH	1	5/1.6	-13/-18	16	120
S-CCPCH containing PCH (SF=256)	1	5/1.6	-13/-18	3	0
DPCH (SF=256)	16/32	63,7/80,4 in total	see 3GPP TS25.141 Table 6.5	see 3GPP TS25.141 Table 6.5	see 3GPP TS25.141 Table 6.5

Test Model 4 [BTS only] Test Model 4 Active Channels

Type	Number of Channels	Fraction of Power (%)	Level setting (dB)	Channelization Code	Timing offset	Type
PCCPCH+SCH	1	50 to 1.6	-3 to -18	1	0	PCCPCH+SCH
Primary CPICH1	1	10	-10	0	0	Primary CPICH1

Note 1: The CPICH channel is optional.

Test Model 4 w/P-CPICH [BTS Only] Test Model 4 Active Channels

Type	Number of Channels	Fraction of Power (%)	Level setting (dB)	Channelization Code	Timing offset	Type
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PCCPCH+SCH H	1	50 to 1.6	−3 to −18	1	0	PCCPCH+SCH
Primary CPICH1	1	10	−10	0	0	Primary CPICH1

Note 1: The CPICH channel is optional.

Test Model 4 Test Model 4 Active Channels

Type	Number of Channels	Fraction of Power (%)	Level setting (dB)	Channelizati on Code	Timing offset	Type
PCCPCH+SCH H	1	50 to 1.6	−3 to −18	1	0	PCCPCH+SCH
Primary CPICH1	1	10	−10	0	0	Primary CPICH1

Note 1: The CPICH channel is optional.

Test Model 5 [BTS only] Table 6.6A: Test Model 5 Active Channels (2000–12 version)

Type	Number of Channels	Fraction of Power (%)	Level setting (dB)	Channelization Code	Timing offset (x256Tchip)
P-CCPCH+SCH	1	7.9	−11	1	0
Primary CPICH	1	7.9	−11	0	0
PICH	1	1.3	−19	16	120
S-CCPCH containing PCH (SF=256)	1	1.3	−19	3	0
DPCH (SF=128)	30/14/6(*)	14/14.2/14.4 in total	see 3GPP TS25.141 Table 6.b	see 3GPP TS25.141 Table 6.b	see 3GPP TS25.141 Table 6.b
HS-SCCH	2	4 in total	see 3GPP TS25.141 Table 6.c	see 3GPP TS25.141 Table 6.c	see 3GPP TS25.141 Table 6.c

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HS-PDSCH (16QAM)	8/4/2(*)	63.6/63.4/63. 2 in total	see 3GPP TS25.141 Table 6.d	see 3GPP TS25.141 Table 6.d	see 3GPP TS25.141 Table 6.d
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Note *:2 HS-PDSCH shall be taken together with 6 DPCH, 4 HS-PDSCH shall be taken with 14 DPCH, and 8 HS-PDSCH shall be taken together with 30 DPCH.

Test Model 5 w/2 HS-PDSCH, w/6 DPCH [BTS only] Table 6.6A: Test Model 5 Active Channels (2000–12 version)

Type	Number of Channels	Fraction of Power (%)	Level setting (dB)	Channelization Code	Timing offset (x256Tchip)
P-CCPCH+SCH	1	7.9	−11	1	0
Primary CPICH	1	7.9	−11	0	0
PICH	1	1.3	−19	16	120
S-CCPCH containing PCH (SF=256)	1	1.3	−19	3	0
DPCH (SF=128)	30/14/6(*)	14/14.2/14.4 in total	see 3GPP TS25.141 Table 6.b	see 3GPP TS25.141 Table 6.b	see 3GPP TS25.141 Table 6.b
HS-SCCH	2	4 in total	see 3GPP TS25.141 Table 6.c	see 3GPP TS25.141 Table 6.c	see 3GPP TS25.141 Table 6.c
HS-PDSCH (16QAM)	8/4/2(*)	63.6/63.4/63.2 in total	see 3GPP TS25.141 Table 6.d	see 3GPP TS25.141 Table 6.d	see 3GPP TS25.141 Table 6.d

Note *:2 HS-PDSCH shall be taken together with 6 DPCH, 4 HS-PDSCH shall be taken with 14 DPCH, and 8 HS-PDSCH shall be taken together with 30 DPCH.

Test Model 5 w/ 4 HS-PDSCH, w/14 DPCH [BTS only] Table 6.6A: Test Model 5 Active Channels (2000–12 version)

Type	Number of Channels	Fraction of Power (%)	Level setting (dB)	Channelization Code	Timing offset (x256Tchip)
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P-CCPCH+SCH	1	7.9	−11	1	0
Primary CPICH	1	7.9	−11	0	0
PICH	1	1.3	−19	16	120
S-CCPCH containing PCH (SF=256)	1	1.3	−19	3	0
DPCH (SF=128)	30/14/6(*)	14/14.2/14.4 in total	see 3GPP TS25.141 Table 6.b	see 3GPP TS25.141 Table 6.b	see 3GPP TS25.141 Table 6.b
HS-SCCH	2	4 in total	see 3GPP TS25.141 Table 6.c	see 3GPP TS25.141 Table 6.c	see 3GPP TS25.141 Table 6.c
HS-PDSCH (16QAM)	8/4/2(*)	63.6/63.4/63.2 in total	see 3GPP TS25.141 Table 6.d	see 3GPP TS25.141 Table 6.d	see 3GPP TS25.141 Table 6.d

Note *:2 HS-PDSCH shall be taken together with 6 DPCH, 4 HS-PDSCH shall be taken with 14 DPCH, and 8 HS-PDSCH shall be taken together with 30 DPCH.

Test Model 5 w/ 8 HS-PDSCH, w/30 DPCH [BTS only] Table 6.6A: Test Model 5 Active Channels (2000–12 version)

Type	Number of Channel s	Fraction of Power (%)	Level setting (dB)	Channelization Code	Timing offset (x256Tch ip)
P-CCPCH+SCH	1	7.9	−11	1	0
Primary CPICH	1	7.9	−11	0	0
PICH	1	1.3	−19	16	120
S-CCPCH containing PCH (SF=256)	1	1.3	−19	3	0
DPCH (SF=128)	30/14/6(*)	14/14.2/14.4 in total	see 3GPP TS25.141 Table 6.b	see 3GPP TS25.141 Table 6.b	see 3GPP TS25.14 1 Table 6.b

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HS-SCCH	2	4 in total	see 3GPP TS25.141 Table 6.c	see 3GPP TS25.141 Table 6.c	see 3GPP TS25.14 1 Table 6.c
HS-PDSCH (16QAM)	8/4/2(*)	63.6/63.4/63.2 in total	see 3GPP TS25.141 Table 6.d	see 3GPP TS25.141 Table 6.d	see 3GPP TS25.14 1 Table 6.d

Note *:2 HS-PDSCH shall be taken together with 6 DPCH, 4 HS-PDSCH shall be taken with 14 DPCH, and 8 HS-PDSCH shall be taken together with 30 DPCH.

Custom Active Channel List BTS [BTS only] The following commands handle the list of custom active channel list for BTS.

INIT – Cleans up all channel entries. Then stores given parameter to the 1st channel entry.

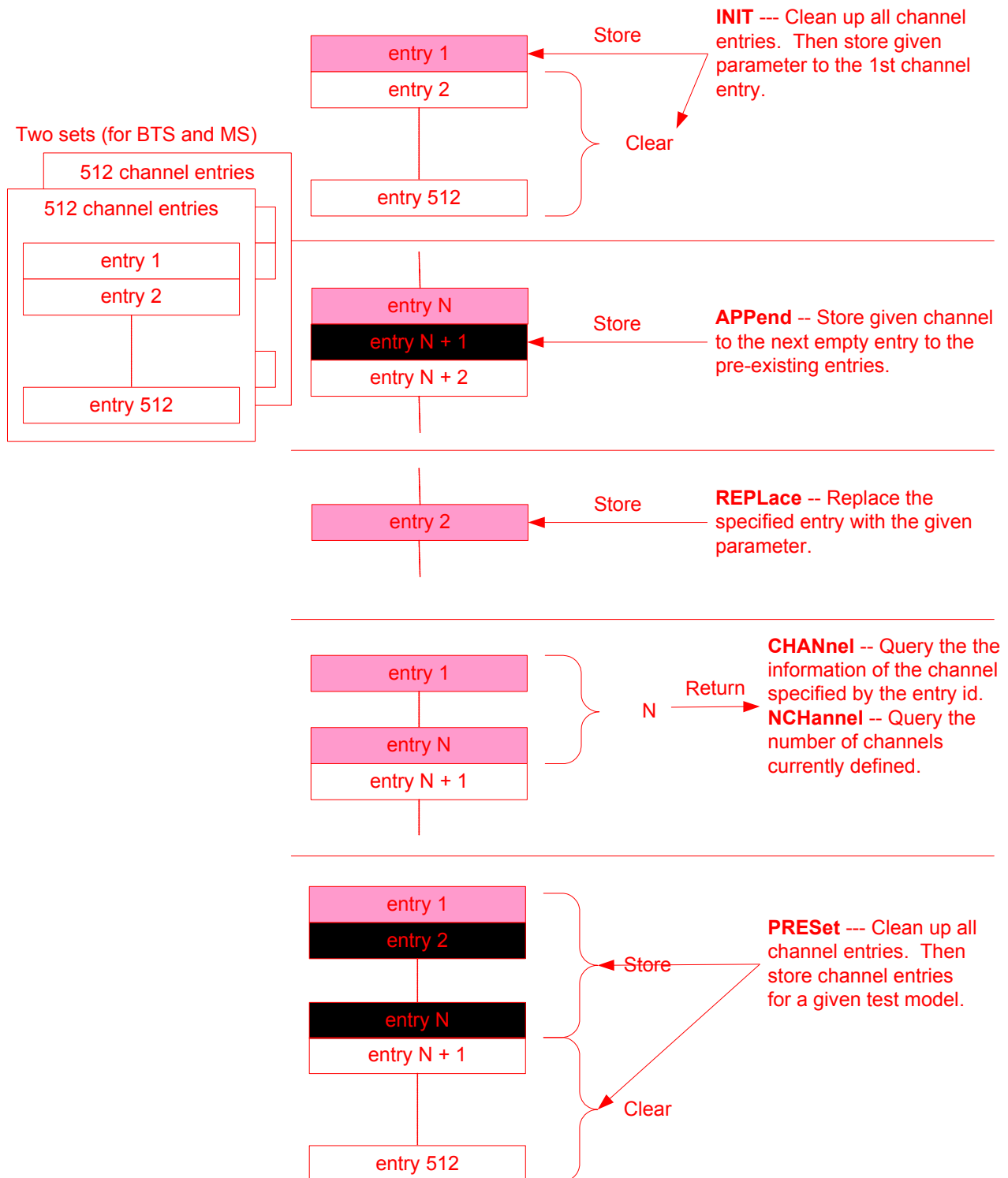
APPend – Stores given channel to the next empty entry to the pre-existing entries.

REPLace - Replaces the specified entry with the given parameter.

CHANnel – Queries the information of the channel specified by the entry id.

NCHannel - Queries the number of channels currently defined.

PRESet – Cleans up all channel entries. Then stores channel entries for a given test model.



Initialize List Initializes the current custom active channel list. This creates a new entry with the specified parameters.

1st parameter:

<symbol_rate> Specifies symbol rate of the channel.

2nd parameter:

<code_num> Specifies code number of the channel.

3rd parameter:

QPSK Specifies the channel's modulation scheme is QPSK.

QAM16 Specifies the channel's modulation scheme is QAM16.
This choice is available only for channels with a symbol rate of 240000.

Mode

WCDMA

Remote Command

[:SENSe] :CWCDma:RHO:SBOundary:LIST[:BTS]:INIT
<symbol_rate>, <code_num>, QPSK|QAM16

Example

In order to predefine the following channels:

```
- CPICH (C8(0))
!- P-CCPCH (C8(1))
!- S-CCPCH(C8(3))
!- PICH(C8(16))
!- HS-DPCCH (C4(15)) 16QAM modulated

!CWCD:RHO:SBO:LIST:BTS:INIT 15000,0, QPSK
!CWCD:RHO:SBO:LIST:BTS:APP 15000,1, QPSK
!CWCD:RHO:SBO:LIST:BTS:APP 15000,3, QPSK
!CWCD:RHO:SBO:LIST:BTS:APP 15000,16, QPSK
!CWCD:RHO:SBO:LIST:BTS:APP 240000,15, QAM16

CWCD:RHO:SBO:LIST:NCH:BTS?
!5

CWCD:RHO:SBO:LIST:BTS:CHAN? 1
!15000,0, QPSK
CWCD:RHO:SBO:LIST:BTS:CHAN? 2
!15000,1, QPSK
CWCD:RHO:SBO:LIST:BTS:CHAN? 3
!15000,3, QPSK
CWCD:RHO:SBO:LIST:BTS:CHAN? 4
!15000,16, QPSK
CWCD:RHO:SBO:LIST:BTS:CHAN? 5
!240000,15, QAM16
```

Notes

(1) This command is effective when [:SENSe]:RADio:DEvice is set to BTS and

[:SENSe]:CWCDma:RHO:SBOundary[:BTS] is set to CUSTom.

(2) QAM16 for the 4th parameter is available only if HSDPA/HSUPA Enable is On

Error messages associated with this parameter:

One of the following error messages is logged if the given parameter is invalid.

If an error is reported, the SCPI command is rejected and the instrument's settings do not change.

(1) "Missing Parameter" This error is reported if the number of parameters is less than 3.

For example,

:SENSe:CWCDma:RHO:SBOundary:LIST:BTS:INIT, 15000, 0 ? 3rd parameter is missing.

(2) "Illegal parameter value" This error is reported if parameter type is invalid or if enum value is invalid.

For example,

:SENSe:CWCDma:RHO:SBOundary:LIST:BTS:INIT, 15000, ON, QPSK ? 2nd parameter must be integer.

:SENSe:CWCDma:RHO:SBOundary:LIST:BTS:INIT 15001, 8, QPSK ? 1st parameter value (Symbol Rate) is not allowed. Only the values given in the Range field are valid for the Symbol Rate. You may specify these in numeric form, but they are interpreted as an enumeration and the error results if the value does not translate to one in the list.

(3) "Data out of range"

This error is reported if parameter value is out of range.

For example,

:SENSe:CWCDma:RHO:SBOundary:LIST:BTS:INIT 15000, 256, QPSK ? 2nd parameter is out of range.

(4) "Setting Conflict"

This error is reported if the given code channel overlaps another code channel in modulation accuracy.

For example, if a user sends the following two commands, the second command causes the error message because C7(0) overlaps C8(0).

:SENSe:CWCDma:RHO:SBOundary:LIST:BTS:INIT 15000, 0, QPSK ? OK

:SENSe:CWCDma:RHO:SBOundary:LIST:BTS:APPend 30000, 0, QPSK ? C7(0) overlaps C8(0)

State Saved

Saved in instrument state.

Range	symbol_rate = 7500 15000 30000 60000 120000 240000 480000 960000 0<= code_num <= 511 if symbol_rate = 7500 0<= code_num <= 255 if symbol_rate = 15000 0<= code_num <= 127 if symbol_rate = 30000 0<= code_num <= 63 if symbol_rate = 60000 0<= code_num <= 31 if symbol_rate = 120000 0<= code_num <= 15 if symbol_rate = 240000 0<= code_num <= 7 if symbol_rate = 480000 0<= code_num <= 3 if symbol_rate = 960000 QAM16 for the 3rd parameter is available only for channels with a symbol rate of 240000. For other channels, specify QPSK.
Instrument S/W Revision	A.01.60 or later

Append List Appends the entry on the list of custom active channel list for BTS.

1st parameter:

<symbol_rate> Specifies symbol rate of the channel.

2nd parameter:

<code_num> Specifies code number of the channel.

3rd parameter:

QPSK Specifies the channel's modulation scheme is QPSK.

QAM16 Specifies the channel's modulation scheme is QAM16.
This choice is available only for channels with a symbol rate of 240000.

Mode	WCDMA
Remote Command	<code>[:SENSe] :CWCDma :RHO :SBOundary :LIST [:BTS] :APPend <symbol_rate>, <code_num>, QPSK QAM16</code>
Example	In order to predefine the following channels: - CPICH (C8(0)) !- P-CCPCH (C8(1)) !- S-CCPCH(C8(3)) !- PICH(C8(16)) !- HS-DPCCH (C4(15)) 16QAM modulated CWCD:RHO:SBO:LIST:BTS:INIT 15000,0, QPSK CWCD:RHO:SBO:LIST:BTS:APP 15000,1, QPSK CWCD:RHO:SBO:LIST:BTS:APP 15000,3, QPSK CWCD:RHO:SBO:LIST:BTS:APP 15000,16, QPSK CWCD:RHO:SBO:LIST:BTS:APP 240000,15, QAM16 CWCD:RHO:SBO:LIST:NCH:BTS? !5 CWCD:RHO:SBO:LIST:BTS:CHAN? 1 !15000,0, QPSK CWCD:RHO:SBO:LIST:BTS:CHAN? 2 !15000,1, QPSK CWCD:RHO:SBO:LIST:BTS:CHAN? 3 !15000,3, QPSK CWCD:RHO:SBO:LIST:BTS:CHAN? 4 !15000,16, QPSK CWCD:RHO:SBO:LIST:BTS:CHAN? 5 !240000,15, QAM16

Notes

(1) This command is effective when [:SENSe]:RADio:DEVIce is set to BTS and

[:SENSe]:CWCDma:RHO:SBOundary[:BTS] is set to CUSTom.

(2) QAM16 for the 4th parameter is available only if HSDPA/HSUPA Enable is On.

(3) The maximum number of entries is 512.

Error messages associated with this parameter:

One of the following error messages is logged if the given parameter is invalid.

If an error is reported, the SCPI command is rejected and the instrument's settings do not change.

(1) "Missing Parameter"

This error is reported if the number of parameters is less than 4.

For example,

:SENSe:CWCDma:RHO:SBOundary:LIST:BTS:APPend, 15000, 0?
3rd parameter is missing.

(2) "Illegal parameter value"

This error is reported if parameter type is invalid or if enum value is invalid.

For example,

:SENSe:CWCDma:RHO:SBOundary:LIST:BTS:APPend 15000, ON,
QPSK ? 2nd parameter must be integer.

:SENSe:CWCDma:RHO:SBOundary:LIST:BTS:APPend, 15001, 8,
QPSK ? 1st parameter value (Symbol Rate) is not allowed.

Only the values given in the Range field are valid for the Symbol Rate. You may specify these in numeric form, but they are interpreted as an enumeration and the error results if the value does not translate to one in the list.

(3) "Data out of range"

This error is reported if parameter value is out of range.

For example,

:SENSe:CWCDma:RHO:SBOundary:LIST:BTS:APPend 15000,
256, QPSK ? 2nd parameter is out of range.

Notes (Continued)

(4) “Setting Conflict”

This error is reported if the given code channel overlaps another code channel in Combined WCDMA.
For example, if a user sends the following two commands, the second command causes the error message because C7(0) overlaps C8(0).

```
:SENSe:CWCDma:RHO:SBOundary:LIST:BTS:INIT, 15000, 0,
QPSK ? OK
:SENSe:CWCDma:RHO:SBOundary:LIST:BTS:APPend 30000, 0,
QPSK ? C7(0) overlaps C8(0)
```

State Saved

Saved in instrument state.

Range

symbol_rate = 7500 | 15000 | 30000 | 60000 | 120000 | 240000 |
480000 | 960000

0<= code_num <= 511 if symbol_rate = 7500

0<= code_num <= 255 if symbol_rate = 15000

0<= code_num <= 127 if symbol_rate = 30000

0<= code_num <= 63 if symbol_rate = 60000

0<= code_num <= 31 if symbol_rate = 120000

0<= code_num <= 15 if symbol_rate = 240000

0<= code_num <= 7 if symbol_rate = 480000

0<= code_num <= 3 if symbol_rate = 960000

QAM16 for the 3rd parameter is available only for channels with a symbol rate of 240000. For other channels, specify QPSK.

Instrument S/W Revision

A.01.60 or later

Replace List Replaces the entry of the custom active channel list for BTS.

1st parameter:

<entry_id> Specifies entry ID of the channel to replace.

2nd parameter:

<symbol_rate> Specifies symbol rate of the channel.

3rd parameter:

<code_num> Specifies code number of the channel.

4th parameter:

QPSK Specifies the channel's modulation scheme is QPSK.
QAM16 Specifies the channel's modulation scheme is QAM16.
This choice is available only for channels with a symbol rate of 240000.

Mode	WCDMA
Remote Command	[:SENSe]:CWCDma:RHO:SBOundary:LIST[:BTS]:REPLace <entry_id>, <symbol_rate>, <code_num>, QPSK QAM16

Example

In order to predefine the following channels:

- CPICH (C8(0))
- !- P-CCPCH (C8(1))
- !- S-CCPCH(C8(3))
- !- PICH(C8(16))
- !- HS-DPCCH (C4(15)) 16QAM modulated

```
CWCD:RHO:SBO:LIST:BTS:INIT 15000,0,QPSK
CWCD:RHO:SBO:LIST:BTS:APP 15000,1,QPSK
CWCD:RHO:SBO:LIST:BTS:APP 15000,3,QPSK
CWCD:RHO:SBO:LIST:BTS:APP 15000,16,QPSK
CWCD:RHO:SBO:LIST:BTS:APP 240000,15,QAM16
```

And, P-CCPCH(C8(3)) is replaced as follows:

```
CWCD:RHO:SBO:LIST:BTS:REPL 3,15000,5,QPSK
```

```
CWCDma:RHO:SBOundary:LIST:NChannels:BTS?
!5
```

```
CWCD:RHO:SBO:LIST:BTS:CHAN? 1
!15000,0, QPSK
CWCD:RHO:SBO:LIST:BTS:CHAN? 2
!15000,1, QPSK
CWCD:RHO:SBO:LIST:BTS:CHAN? 3
!15000,5, QPSK
CWCD:RHO:SBO:LIST:BTS:CHAN? 4
!15000,16, QPSK
CWCD:RHO:SBO:LIST:BTS:CHAN? 5
!240000,15, QAM16
```

Notes

(1) This command is effective when [:SENSe]:RADio:DEVIce is set to BTS and

[:SENSe]:CWCDma:RHO:SBOundary[:BTS] is set to CUSTom.

(2) QAM16 for the 4th parameter is available only if HSDPA/HSUPA Enable is On.

(3) The maximum number of entries is 512.

Error messages associated with this parameter:

One of the following error messages is logged if the given parameter is invalid.

If an error is reported, the SCPI command is rejected and the instrument's settings do not change.

(1) "Missing Parameter"

This error is reported if the number of parameters is less than 4.

For example,

:SENSe:CWCDma:RHO:SBOundary:LIST:BTS:REPLace 1,15000, 0 ? 4th parameter is missing.

(2) "Illegal parameter value"

This error is reported if parameter type is invalid or if enum value is invalid.

For example,

:SENSe:CWCDma:RHO:SBOundary:LIST:BTS:REPLace 1,15000, ON, QPSK ? 3rd parameter must be integer.

:SENSe:CWCDma:RHO:SBOundary:LIST:BTS:REPLace 1,15001, 8, QPSK ? 2nd parameter value (Symbol Rate) is not allowed.

Only the values given in the Range field are valid for the Symbol Rate. You may specify these in numeric form, but they are interpreted as an enumeration and the error results if the value does not translate to one in the list.

(3) "Data out of range"

This error is reported if parameter value is out of range.

For example,

:SENSe:CWCDma:RHO:SBOundary:LIST:BTS:REPLace 1,15000, 256, QPSK ? 3rd parameter is out of range.

"Setting Conflict"

This error is reported if the given code channel overlaps another code channel in Combined WCDMA.

For example, if a user sends the following two commands, the second command causes the error message because C7(0) overlaps C8(0).

:SENSe:CWCDma:RHO:SBOundary:LIST:BTS:INIT 15000, 0, QPSK ? OK

:SENSe:CWCDma:RHO:SBOundary:LIST:BTS:REPLace 1,30000, 0, QPSK ? C7(0) overlaps C8(0)

(5) The entry ID out of range:

1 <= entry_id <= The number of entries which is currently appended.

State Saved	Saved in instrument state.
Range	The entry ID must be: 1 <= entry_id <= The number of entries which is currently appended. symbol_rate = 7500 15000 30000 60000 120000 240000 480000 960000 0<= code_num <= 511 if symbol_rate = 7500 0<= code_num <= 255 if symbol_rate = 15000 0<= code_num <= 127 if symbol_rate = 30000 0<= code_num <= 63 if symbol_rate = 60000 0<= code_num <= 31 if symbol_rate = 120000 0<= code_num <= 15 if symbol_rate = 240000 0<= code_num <= 7 if symbol_rate = 480000 0<= code_num <= 3 if symbol_rate = 960000 QAM16 for the 4th parameter is available only for channels with a symbol rate of 240000. For other channels, specify QPSK.
Instrument S/W Revision	A.01.60 or later

Query List This command returns the entry of the custom active channel list for BTS.

1st parameter:

<entry_id> Specifies entry ID of the channel to query.

Mode	WCDMA
Remote Command	[:SENSe]:CWCDma:RHO:SBOundary:LIST[:BTS]:CHANnel?<entry_id>

Example

In order to predefine the following channels:

- CPICH (C8(0))
- !- P-CCPCH (C8(1))
- !- S-CCPCH(C8(3))
- !- PICH(C8(16))
- !- HS-DPCCH (C4(15)) 16QAM modulated

```
CWCD:RHO:SBO:LIST:BTS:INIT 15000,0,QPSK
CWCD:RHO:SBO:LIST:BTS:APP 15000,1,QPSK
CWCD:RHO:SBO:LIST:BTS:APP 15000,3,QPSK
CWCD:RHO:SBO:LIST:BTS:APP 15000,16,QPSK
CWCD:RHO:SBO:LIST:BTS:APP 240000,15,QAM16
```

```
CWCD:RHO:SBO:LIST:NCH:BTS?
!5
```

```
CWCD:RHO:SBO:LIST:BTS:CHAN? 1
!15000,0,QPSK
CWCD:RHO:SBO:LIST:BTS:CHAN? 2
!15000,1, QPSK
CWCD:RHO:SBO:LIST:BTS:CHAN? 3
!15000,3, QPSK
CWCD:RHO:SBO:LIST:BTS:CHAN? 4
!15000,16, QPSK
CWCD:RHO:SBO:LIST:BTS:CHAN? 5
!240000,15, QAM16
```

Notes	(1) This command is effective when [:SENSe]:RADio:DEvice is set to BTS and [:SENSe]:CWCDma:RHO:SBOundary[:BTS] is set to CUSTom. (2) QAM16 for the 4th parameter is available only if HSDPA/HSUPA Enable is On. (3) The maximum number of entries is 512. Default value of the parameter By default, one channel is defined. (CPICH C8(0)) In order to query the default entry, specify 1 for <entry_id>: :SENSe:CWCDma:RHO:SBOundary:LIST:BTS:CHANnel? 1 The instrument returns an array of three values: 15000, 0, QPSK Query command needs <entry_id> parameter The <entry_id> parameter is always required for a query command. The range of the parameter is from 1 to the total number of channels you have defined. For example, if you have defined two channels, you can query them as follows: :SENSe:CWCDma:RHO:SBOundary:LIST:BTS:CHANnel? 1 :SENSe:CWCDma:RHO:SBOundary:LIST:BTS:CHANnel? 2 If you want to know the number of channels you have defined, send the following query command: :SENSe:CWCDma:RHO:SBOundary:LIST:BTS:NCHannels? Error messages associated with this parameter: The following error message is logged if the given parameter is invalid. If an error is reported, the SCPI command is rejected and the instrument's settings do not change. <entry_id> out of range The entry ID must be: 1 <= entry_id <= The number of entries which is currently appended.
Preset	15000, 0, QPSK
State Saved	Saved in instrument state.
Range	1 <= entry_id <= the number of channels defined <= 512 (<entry_id> is an integer ranging from 1 to 512.)
Instrument S/W Revision	A.01.60 or later

The number of entries Returns the number of entries in the custom predefined active channel list BTS. This is a query only command.

Mode	WCDMA
Remote Command	[:SENSe] :CWCDma:RHO:SBOundary:LIST[:BTS]:NCHannels?
Example	CWCD:RHO:SBO:LIST:NCH?
Notes	This command is effective when [:SENSe]:RADio:DEvice is set to BTS and [:SENSe]:CWCDma:RHO:SBOundary[:BTS] is set to CUSTom. This command is a query-only command.
Preset	1
State Saved	No
Instrument S/W Revision	A.01.60 or later

Load Preset Setting Loads preset setting to the custom active channel list BTS. This is a command-only command; it does not support a query.

Mode	WCDMA
Remote Command	[:SENSe] :CWCDma:RHO:SBOundary:LIST[:BTS]:PRESet TM1D16 TM1D32 TM1D64 TM1D16SC TM1D32SC TM1D64SC TM2 TM2SC TM3D16 TM3D32 TM3D16SC TM3D32SC TM4 TM4CP TM5H2 TM5H4 TM5H8
Example	CWCD:RHO:SBO:LIST:PRES TM1D64
Notes	(1) This command is effective when [:SENSe]:RADio:DEvice is set to BTS and [:SENSe]:CWCDma:RHO:SBOundary[:BTS] is set to CUSTom. (2) TM5H2, TM5H4, TM5H8 parameters are allowed if HSDPA/HSUPA Enable is On. This command is a command-only command; it does not support a query.
State Saved	No

Range	TM1D16 TM1D32 TM1D64 TM1D16SC TM1D32SC TM1D64SC C TM2 TM2SC TM3D16 TM3D32 TM3D16SC TM3D32SC TM4 TM4CP TM5H2 TM5H4 TM5H8.
Instrument S/W Revision	A.01.60 or later

Symbol Boundary MS [MS only]

Selects the symbol boundary detection mode for MS that allows you to specify the active channel detection scheme for the uplink.

AUTO – Select this feature to set the symbol boundary detection to the automatic mode. Various code channels are measured and the most appropriate code channel is selected as the reference channel.

CUSTom – Select this feature to specify a customized list of active channels using a remote command. All specified channels are considered as active.

Mode	WCDMA
Remote Command	[:SENSe] :CWCDma :RHO :SBOundary :MS AUTO CUSTom [:SENSe] :CWCDma :RHO :SBOundary :MS?
Example	CWCD:RHO:SBO:MS CUST CWCD:RHO:SBO:MS?
Notes	This parameter is effective when [:SENSe]:RADio:DEVICE is set to MS.
Preset	AUTO
State Saved	Saved in instrument state.
Range	Auto Custom
Instrument S/W Revision	A.01.60 or later

Custom Active Channel List MS [MS only] The following commands handle the list of custom predefined channels for MS.

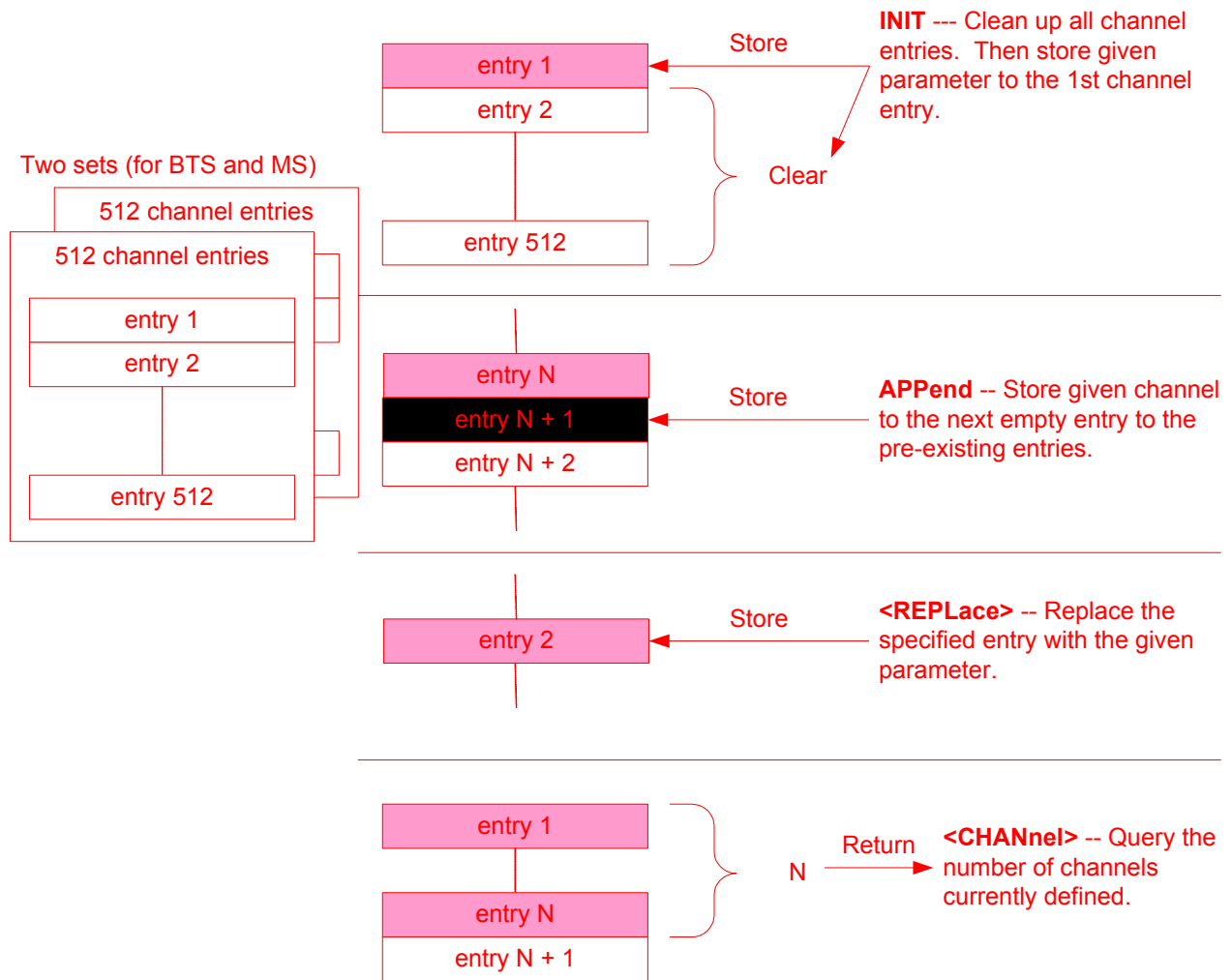
INIT – Cleans up all channel entries. Then stores given parameter to the 1st channel entry.

APPend – Stores given channel to the next empty entry to the pre-existing entries.

REPLace - Replaces the specified entry with the given parameter.

CHANnel – Queries the information of the channel specified by the entry id.

NCHannel - Queries the number of channels currently defined.



Initialize List Initializes the current custom active channel list. This creates a new entry with the given parameter.

1st parameter:

<symbol_rate> Specifies symbol rate of the channel.

2nd parameter:

<code_num> Specifies spreading code of the channel.

3rd parameter:

IPH Specifies the channel is on the I-axis.

QPH Specifies the channel is on the Q-axis.

Mode

WCDMA

Remote Command

```
[ :SENSe]:CWCDma:RHO:SBOundary:LIST:MS:INIT
<symbol_rate>, <code_num>, IPH|QPH
```

Example

In order to predefine the following channels:

!- DPCCH (C8(0):Q)

!- DPDCH (C6(16):I)

```
CWCD:RHO:SBO:LIST:MS:INIT 15000,0,QPH
```

```
CWCD:RHO:SBO:LIST:MS:APP 60000,16,IPH
```

```
CWCD:RHO:SBO:LIST:NCH:MS?
```

```
!2
```

```
CWCD:RHO:SBO:LIST:MS:CHAN? 1
```

```
!15000,0,QPH
```

```
CWCD:RHO:SBO:LIST:MS:CHAN? 2
```

```
!60000,16,IPH
```

Notes

(1) This command is effective if [:SENSe]:RADio:DEVIce is set to MS and

[:SENSe]:CWCDma:RHO:SBOundary:MS is set to CUSTom.

(2) symbol_rate = 1920000 is available if HSDPA/HSUPA Enable is On.

(3) The maximum number of entries is 512.

One of the following error messages is logged if the given parameter is invalid:

If an error is reported, the SCPI command is rejected and the instrument's settings do not change.

(1) "Missing Parameter"

This error is reported if the number of parameters is less than 3.

For example,

:SENSe:CWCDma:RHO:SBOundary:LIST:MS:INIT 15000, 0 ? 3rd parameter is missing.

(2) "Illegal parameter value"

This error is reported if parameter type is invalid or if enum value is invalid.

For example,

:SENSe:CWCDma:RHO:SBOundary:LIST:MS:INIT 15000, ON, QPH ? 2nd parameter must be integer.

:SENSe:CWCDma:RHO:SBOundary:LIST:MS:INIT 15001, 0, QPH ? 1st parameter value (Symbol Rate) is not allowed.

Only the values given in the Range field are valid for the Symbol Rate. You may specify these in numeric form, but they are interpreted as an enumeration and the error results if the value does not translate to one in the list.

(3) "Data out of range"

This error is reported if parameter value is out of range.

For example,

:SENSe:CWCDma:RHO:SBOundary:LIST:MS:INIT 15000, 256, QPH ? 2nd parameter is out of range.

(4) "Setting Conflict"

This error is reported if the given code channel overlaps another code channel in modulation Accuracy.

For example, if a user sends the following two commands, the second command causes the error message because C7(0):Q overlaps C8(0):Q.

:SENSe:CWCDma:RHO:SBOundary:LIST:MS:INIT 15000, 0, QPH ? OK

:SENSe:CWCDma:RHO:SBOundary:LIST:MS:APPend 30000, 0, QPH ? C7(0):Q overlaps C8(0):Q

State Saved	Saved in instrument state.
Range	symbol_rate = 15000 30000 60000 120000 240000 480000 960000 19200000 0<= code_num <= 255 if symbol_rate = 15000 0<= code_num <= 127 if symbol_rate = 30000 0<= code_num <= 63 if symbol_rate = 60000 0<= code_num <= 31 if symbol_rate = 120000 0<= code_num <= 15 if symbol_rate = 240000 0<= code_num <= 7 if symbol_rate = 480000 0<= code_num <= 3 if symbol_rate = 960000 0<= code_num <= 1 if symbol_rate = 1920000
Instrument S/W Revision	A.01.60 or later

Append List Appends the entry to the custom active channel list.

1st parameter:

<symbol_rate> Specifies symbol rate of the channel.

2nd parameter:

<code_num> Specifies spreading code of the channel.

3rd parameter:

IPH Specifies the channel is on the I-axis.

QPH Specifies the channel is on the Q-axis.

Mode WCDMA

Remote Command

```
[ :SENSe] :CWCDma:RHO:SBOundary:LIST:MS:APPend  
<symbol_rate>, <code_num>, IPH|QPH
```

Example

In order to predefine the following channels:

!- DPCCH (C8(0):Q)

!- DPDCH (C6(16):I)

CWCD:RHO:SBO:LIST:MS:INIT 15000,0,QPH

CWCD:RHO:SBO:LIST:MS:APP 60000,16,IPH

CWCD:RHO:SBO:LIST:NCH:MS?

!2

CWCD:RHO:SBO:LIST:MS:CHAN? 1

!15000,0,QPH

CWCD:RHO:SBO:LIST:MS:CHAN? 2

!60000,16,IPH

Notes

(1) This command is effective if [:SENSe]:RADio:DEvice is set to MS and

[:SENSe]:CWCDma:RHO:SBOundary:MS is set to CUSTom.

(2) symbol_rate = 1920000 is available if HSDPA/HSUPA Enable is On.

(3) The maximum number of entries is 512.

One of the following error messages is logged if the given parameter is invalid:

If an error is reported, the SCPI command is rejected and the instrument's settings do not change.

(1) "Missing Parameter"

This error is reported if the number of parameters is less than 3.

For example,

:SENSe:CWCDma:RHO:SBOundary:LIST:MS:APPend 15000, 0 ?
3rd parameter is missing.

(2) "Illegal parameter value"

This error is reported if parameter type is invalid or if enum value is invalid.

For example,

:SENSe:CWCDma:RHO:SBOundary:LIST:MS:APPend 15000, ON,
QPH ? 2nd parameter must be integer.

:SENSe:CWCDma:RHO:SBOundary:LIST:MS:APPend 15001, 0,
QPH ? 1st parameter value (Symbol Rate) is not allowed.

Only the values given in the Range field are valid for the Symbol Rate. You may specify these in numeric form, but they are interpreted as an enumeration and the error results if the value does not translate to one in the list.

(3) "Data out of range"

This error is reported if parameter value is out of range.

For example,

:SENSe:CWCDma:RHO:SBOundary:LIST:MS:APPend 15000, 256,
QPH ? 2nd parameter is out of range.

(4) "Setting Conflict"

This error is reported if the given code channel overlaps another code channel in modulation accuracy.

For example, if a user sends the following two commands, the second command causes the error message because C7(0):Q overlaps C8(0):Q.

:SENSe:CWCDma:RHO:SBOundary:LIST:MS:INIT 15000, 0, QPH
? OK

:SENSe:CWCDma:RHO:SBOundary:LIST:MS:APPend 30000, 0,
QPH ? C7(0):Q overlaps C8(0):Q

State Saved	Saved in instrument state.
Range	symbol_rate = 15000 30000 60000 120000 240000 480000 960000 19200000 0<= code_num <= 255 if symbol_rate = 15000 0<= code_num <= 127 if symbol_rate = 30000 0<= code_num <= 63 if symbol_rate = 60000 0<= code_num <= 31 if symbol_rate = 120000 0<= code_num <= 15 if symbol_rate = 240000 0<= code_num <= 7 if symbol_rate = 480000 0<= code_num <= 3 if symbol_rate = 960000 0<= code_num <= 1 if symbol_rate = 1920000
Instrument S/W Revision	A.01.60 or later

Replace List Replaces an entry in the custom active channel list.

1st parameter:

<entry_id> Specifies entry ID of the channel to replace.

2nd parameter:

<symbol_rate> Specifies symbol rate of the channel.

3rd parameter:

<code_num> Specifies spreading code of the channel.

4th parameter:

IPH Specifies the channel is on the I-axis.

QPH Specifies the channel Is on the Q-axis.

Mode

WCDMA

Remote Command

```
[ :SENSe] :CWCDma:RHO:SBOundary:LIST:MS:REPLace
<entry_id>,<symbol_rate>, <code_num>, IPH|QPH
```

Example

In order to predefine the following channels:

!- DPCCH (C8(0):Q)

!- DPDCH (C6(16):I)

```
CWCD:RHO:SBO:LIST:MS:INIT 15000,0,QPH
```

```
CWCD:RHO:SBO:LIST:MS:APP 60000,16,IPH
```

```
CWCD:RHO:SBO:LIST:NCH:MS?
```

```
!2
```

And, replace 2nd entry.

```
CWCD:RHO:SBO:LIST:MS:REPL 2,60000,17,QPH
```

```
CWCD:RHO:SBO:LIST:MS:CHAN? 1
```

```
!15000,0,QPH
```

```
CWCD:RHO:SBOundary:LIST:MS:CHANnel? 2
```

```
!60000,17,IPH
```

Notes

(1) This command is effective if [:SENSe]:RADio:DEVEice is set to MS and

[:SENSe]:CWCDma:RHO:SBOundary:MS is set to CUSTom.

(2) symbol_rate = 1920000 is available if HSDPA/HSUPA Enable is On.

(3) The maximum number of entries is 512.

One of the following error messages is logged if the given parameter is invalid:

If an error is reported, the SCPI command is rejected and the instrument's settings do not change.

(1) "Missing Parameter"

This error is reported if the number of parameters is less than 4.

For example,

:SENSe:CWCDma:RHO:SBOundary:LIST:MS:REPLace 1,15000, 0
? 4th parameter is missing.

(2) "Illegal parameter value"

This error is reported if parameter type is invalid or if enum value is invalid.

For example,

:SENSe:CWCDma:RHO:SBOundary:LIST:MS: REPLace 1,15000,
ON, QPH ? 3rd parameter must be integer.

:SENSe:CWCDma:RHO:SBOundary:LIST:MS:REPLace 1,15001, 0,
QPH ? 2nd parameter value (Symbol Rate) is not allowed.

Only the values given in the Range field are valid for the Symbol Rate. You may specify these in numeric form, but they are interpreted as an enumeration and the error results if the value does not translate to one in the list.

(3) "Data out of range"

This error is reported if parameter value is out of range.

For example,

:SENSe:CWCDma:RHO:SBOundary:LIST:MS:APPend 15000, 256,
QPH ? 3rd parameter is out of range.

Notes (Continued)

(4) “Setting Conflict”

This error is reported if the given code channel overlaps another code channel in modulation accuracy.

For example, if a user sends the following two commands, the second command causes the error message because C7(0):Q overlaps C8(0):Q.

```
:SENSe:CWCDma:RHO:SBOundary:LIST:MS:INIT 15000, 0, QPH
? OK
:SENSe:CWCDma:RHO:SBOundary:LIST:MS: REPLace 1,30000,
0, QPH ? C7(0):Q overlaps C8(0):Q
```

(5) The entry ID out of range

1 <= entry_id <= The number of entries which is currently appended.

State Saved

Saved in instrument state.

Range

The entry ID must be:

1 <= entry_id <= The number of entries which is currently appended.

symbol_rate = 15000 | 30000 | 60000 | 120000 | 240000 | 480000
| 960000 | 19200000

0<= code_num <= 255 if symbol_rate = 15000

0<= code_num <= 127 if symbol_rate = 30000

0<= code_num <= 63 if symbol_rate = 60000

0<= code_num <= 31 if symbol_rate = 120000

0<= code_num <= 15 if symbol_rate = 240000

0<= code_num <= 7 if symbol_rate = 480000

0<= code_num <= 3 if symbol_rate = 960000

0<= code_num <= 1 if symbol_rate = 1920000

Instrument S/W Revision

A.01.60 or later

Query List This command returns the entry of the custom active channel list.

1st parameter:

<entry_id> Specifies entry ID of the channel to query

Mode	WCDMA
Remote Command	[:SENSe] :CWCDma :RHO :SBOundary :LIST :MS :CHANnel ? <entry_id>
Example	In order to predefine the following channels: !- DPCCH (C8(0):Q) !- DPDCH (C6(16):I) CWCD:RHO:SBO:LIST:MS:INIT 15000,0,QPH CWCD:RHO:SBO:LIST:MS:APP 60000,16,IPH CWCD:RHO:SBO:LIST:NCH:MS? !2 CWCD:RHO:SBO:LIST:MS:CHAN? 1 !15000, 0, QPH CWCD:RHO:SBO:LIST:MS:CHAN? 2 !60000, 16, IPH

Notes	(1) This command is effective if [:SENSe]:RADio:DEvice is set to MS and [:SENSe]:CWCDma:RHO:SBOundary:MS is set to CUSTom. (2) symbol_rate = 1920000 is available if HSDPA/HSUPA Enable is On. (3) The maximum number of entries is 512. Default value of the parameter By default, one channel is defined. (DPCCH C8(0):Q) In order to query the default entry, specify 1 for <entry_id>: :SENSe:CWCDma:RHO:SBOundary:LIST:MS:CHANnel? 1 The instrument returns an array of three values: 15000, 0, QPH
	Query command needs <entry_id> parameter The <entry_id> parameter is always required for the query command. The range of the parameter is from 1 to the total number of channels you have defined. For example, if you have defined two channels, you can query them as follows: :SENSe:CWCDma:RHO:SBOundary:LIST:MS:CHANnel? 1 :SENSe:CWCDma:RHO:SBOundary:LIST:MS:CHANnel? 2 If you want to know the number of channels you have defined, send the following query command: :SENSe:CWCDma:RHO:SBOundary:LIST:NCHannels:MS?
	The following error message is logged if the given parameter is invalid: If an error is reported, the SCPI command is rejected and the instrument's settings do not change. <entry_id> out of range The entry ID must be: 1 <= entry_id <= The number of entries which is currently appended.
Preset	15000, 0, QPH
State Saved	Saved in instrument state.
Range	The entry ID must be: 1 <= entry_id <= The number of entries which is currently appended.
Instrument S/W Revision	A.01.60 or later

The Number of Entries Returns the number of entries in the custom predefined active channel list MS. This command is query only.

Mode	WCDMA
Remote Command	[:SENSe] :CWCDma:RHO:SBOundary:LIST:MS:NCHannels?
Example	CWCD:RHO:SBO:LIST:MS:NCH?
Notes	This command is effective when [:SENSe]:RADio:DEvice is set to MS and [:SENSe]:CWCDma:RHO:SBOundary:MS is set to CUSTom. This command is a query-only command.
Preset	1
State Saved	No
Instrument S/W Revision	A.01.60 or later

Sync Start Slot

Specifies the slot number to measure as the first slot. You can then use any trigger, even Free Run to get the measurement result beginning with the specified slot number. For example, if the Sync Start Slot state is set to On and the start slot number is 0, then the synchronization always starts from slot number 0 regardless of the trigger type and its delay.

If Sync Start Slot state is set to Off, the measurement performs synchronization at any slot found immediately after the trigger timing.

Mode	WCDMA
Remote Command	[:SENSe] :CWCDma:RHO:SSLot:NUMBer <integer> [:SENSe] :CWCDma:RHO:SSLot:NUMBer? [:SENSe] :CWCDma:RHO:SSLot[:STATe] OFF ON 0 1 [:SENSe] :CWCDma:RHO:SSLot[:STATe] ?
Example	CWCD:RHO:SSL:NUMB 5 CWCD:RHO:SSL:NUMB? CWCD:RHO:SSL:STAT ON CWCD:RHO:SSL:STAT?

Notes	Turn first slot number detection mode on or off.
Preset	0 OFF
State Saved	Saved in instrument state.
Range	0 to 14
Test MIN/MAX/DEF	No
Test UP/DOWN	1
Instrument S/W Revision	A.01.60 or later

Transient Period Exclude

Selects either to include or to exclude the transient period. The transient period is specified in the 3GPP standard TS 34.121, as 25us before each slot boundary and 25 us after each slot boundary. The 3GPP standard requires that the transient period is not included for the power measurement.

This command is available only when the device is MS.

Mode	WCDMA
Remote Command	[:SENSe]:CWCDma:RHO:SWEep:TIME:TRANsient INCLude EXCLude [:SENSe]:CWCDma:RHO:SWEep:TIME:TRANsient?
Example	CWCD:RHO:SWE:TIME:TRAN INCL CWCD:RHO:SWE:TIME:TRAN?
Preset	INCLude
State Saved	Saved in instrument state.
Instrument S/W Revision	A.01.60 or later

Spectrum

Sets a spectrum to either normal or inverted for demodulation related measurements. If set to INVert, the upper and lower spectrums are swapped.

The Invert function conjugates the spectrum, which is equivalent to taking the negative of

the quadrature component in demodulation. The correct setting (Normal or Invert) depends on whether the signal at the input of the instrument has a high or low side mix.

Mode	WCDMA
Remote Command	[:SENSe]:CWCDma:RHO:SPECTrum INVert NORMal [:SENSe]:CWCDma:RHO:SPECTrum?
Example	CWCD:RHO:SPEC INV CWCD:RHO:SPEC?
Preset	NORMal
State Saved	Saved in instrument state.
Instrument S/W Revision	A.01.60 or later

EVM Result I/Q Offset

Toggles the I/Q origin offset function between Std (standard) and Exclude.

Std: The measurement results for EVM, Rho, and Modulation Accuracy (Rho) error take into account the I/Q origin offset.

Exclude: The measurement results for EVM, Rho, and Modulation Accuracy (Rho) error do not take into account the I/Q origin offset, and the message “EVM excludes I/Q Offset” is displayed in the lower right-hand graph display area.

Turns the automatic mode On or Off, for the I/Q origin offset function.

Exclude: OFF – The measurement results for EVM and Rho do not take into account the I/Q origin offset.

Standard: ON – The measurement results for EVM and Rho take into account the I/Q origin offset.

Mode	WCDMA
Remote Command	:CALCulate:CWCDma:RHO:IQOffset:INCLude OFF ON 0 1 :CALCulate:CWCDma:RHO:IQOffset:INCLude?
Example	CALC:CWCD:RHO:IQOF:INCL ON CALC:CWCD:RHO:IQOF:INCL?
Preset	ON
State Saved	Saved in instrument state.

Instrument S/W Revision A.01.60 or later

Active Set Threshold

Toggles the active channel identification function between Auto and Man. If set to Auto, the active channels are determined automatically by the internal algorithm. If set to Man, the active channel identification is determined by a user definable threshold ranging from 0.00 to –100.00 dB.

Mode	WCDMA
Remote Command	:CALCulate:CWCDma:RHO:ASET:THReshold <rel_amp1> :CALCulate:CWCDma:RHO:ASET:THReshold? CALCulate:CWCDma:RHO:ASET:THReshold:AUTO OFF ON 0 1 CALCulate:CWCDma:RHO:ASET:THReshold:AUTO?
Example	CALC:CWCD:RHO:ASET:THR –20.0 CALC:CWCD:RHO:ASET:THR? CALC:CWCD:RHO:ASET:THR:AUTO ON CALC:CWCD:RHO:ASET:THR:AUTO?
Notes	This command is effective when [:SENSe]:CWCDma:RHO:SBOundary[:BTS] is set to AUTO. (For MS, this command is always effective.) Turn the automatic mode On or Off, for the active channel identification function. OFF – The active channel identification for each code channel is determined by a value set by CALCulate:CWCDma:RHO:ASET:THReshold. ON – The active channels are determined automatically by the internal algorithm.
Preset	0.0 ON
State Saved	Saved in instrument state.
Min	–100.0
Max	0.0
Test MIN/MAX/DEF	Yes
Test UP/DOWN	10

Instrument S/W Revision A.01.60 or later

Chip Rate

Sets the chip rate.

Mode	WCDMA
Remote Command	[:SENSe]:CWCDma:RHO:CRATe <freq> [:SENSe]:CWCDma:RHO:CRATe?
Example	CWCD:RHO:CRAT 3900000 CWCD:RHO:CRAT?
Preset	3.84 MHz
State Saved	Saved in instrument state.
Min	3.456 MHz
Max	4.224 MHz
Test MIN/MAX/DEF	Yes
Test UP/DOWN	1.0 kHz
Instrument S/W Revision	A.01.60 or later

DTX/Burst Detect

For downlink signals, detects the power burst for either “CM” (Compressed Mode) or “DTX”. In the case of “Compressed Mode”, both I and Q symbol power are set to Off. In the case of “DTX”, either I or Q symbol power, or both, can be set to Off.

For uplink signals, this function detects the HS-DPCCH burst, the subframe of which does not align with the DPCCH slot boundary.

Mode	WCDMA
Remote Command	:CALCulate:CWCDma:RHO:DTXBurst 0 1 OFF ON :CALCulate:CWCDma:RHO:DTXBurst?

Example	CALC:CWCD:RHO:DTXB ON CALC:CWCD:RHO:DTXB?
Notes	If the HSDPA/HSUPA option is enabled, this parameter is active and effective for both uplink and downlink. If the HSDPA/HSUPA option is disabled, this parameter is active and effective only for downlink.
Preset	OFF
State Saved	Saved in instrument state.
Instrument S/W Revision	A.01.60 or later

PRACH:SIGNPICH Code Number

Specifies the code number for PICH, which contains the DTX (no transmission) part. PICH has 300 bits in 1 radio frame, but the last 12 bits are not transmitted. Then, PICH needs special handling to measure code domain power. The PICH Code Number enables you to specify which code channel should be set as PICH.

Mode	WCDMA
Remote Command	[:SENSe] :CWCDma:RHO:PICH:SPRead <integer> [:SENSe] :CWCDma:RHO:PICH:SPRead?
Example	CWCD:RHO:PICH:SPR 16 CWCD:RHO:PICH:SPR?
Notes	(1) If PICH Code Number and MICH Code Number are the same, the channel is considered as PICH. (2) This parameter is active for BTS. (3) This parameter is meaningful only if the Symbol Boundary setting is Auto.
Preset	16
State Saved	Saved in instrument state.
Min	0
Max	255
Test MIN/MAX/DEF	Yes
Test UP/DOWN	1
Instrument S/W Revision	A.01.60 or later

MICH Code Number [BTS only]

Specifies the code number for MICH (MBMS Indicator channel), which contains the DTX (no transmission) part. MICH has 300 bits in 1 radio frame, but the last 6 symbols (12 bits) are not transmitted. Therefore, MICH needs special handling to measure code domain power. The MICH Code Number specifies which code channel should be considered as MICH.

Since MICH is an optional channel, the parameter has a BAF setting (On | Off).

Note: Active ID auto-detection is performed. However, the result can be 7.5ksps channel if MICH's two consecutive demod bits are the same. If this occurs, these 7.5ksps channels are automatically set to be 15ksps channels.

Mode	WCDMA
Remote Command	[:SENSe]:CWCDma:RHO:MICH:SPRead <integer> [:SENSe]:CWCDma:RHO:MICH:SPRead? [:SENSe]:CWCDma:RHO:MICH:STATe OFF ON 0 1 [:SENSe]:CWCDma:RHO:MICH:STATe?
Example	CWCD:RHO:MICH:SPR 4 CWCD:RHO:MICH:SPR? CWCD:RHO:MICH:STAT ON CWCD:RHO:MICH:STAT?
Notes	(1) If the PICH Code Number and MICH Code Number are the same, the channel is considered as PICH. (2) This parameter is active for BTS. (3) This parameter is meaningful only if Symbol Boundary setting is Auto. This parameter enables or disables MICH code number setting.
Preset	2 OFF
State Saved	Saved in instrument state.
Min	2
Max	255
Test UP/DOWN	1
Instrument S/W Revision	A.01.60 or later

Timing Estimation

Selects between channel-by-channel and global timing estimation functions for MMSE.

Channel-by-Channel: The code channels are estimated using individual timing. This function takes longer.

Global: The individual code channels are estimated using global timing. This function takes less time.

Mode	WCDMA
Remote Command	[:SENSe]:CWCDma:RHO:MCEstimator:TIMing CHANnel GLOBal [:SENSe]:CWCDma:RHO:MCEstimator:TIMing?
Example	CWCD:RHO:MCES:TIM CHAN CWCD:RHO:MCES:TIM?
Preset	GLOBal
State Saved	Saved in instrument state.
Instrument S/W Revision	A.01.60 or later

Multi Channel Estimator

Allows you to toggle the multi channel estimator function for MMSE between On and Off.

On: The individual code channels are aligned to the pilot channel to improve the phase error (whether each code phase is aligned or not). This takes a longer time.

Off: The phase information is computed from one coded signal only. (The phase of each code channel needs to be aligned to the pilot channel.) This operation is briefer.

Mode	WCDMA
Remote Command	[:SENSe]:CWCDma:RHO:MCEstimator OFF ON 0 1 [:SENSe]:CWCDma:RHO:MCEstimator?
Example	CWCD:RHO:MCES ON CWCD:RHO:MCES?
Preset	OFF

State Saved	Saved in instrument state.
Instrument S/W Revision	A.01.60 or later

Frequency Error Tolerance Range

Specifies the frequency error tolerance range as one of the following:

- Normal provides a more stringent range of frequency tolerance, which is useful when you want to accurately demodulate signals of higher complexity. For example, when composite channels are modulated on the same signal, the modulation is complex, and frequency error is critical to correct demodulate. In the case of demodulating complex signals, set to 'Normal'
- Wide provides a wider, and less stringent range of frequency error tolerance.

This parameter is valid only when the device type is MS (Uplink).

Mode	WCDMA
Remote Command	[:SENSe]:CWCDma:RHO:FERRor:TRANge WIDE NORMal [:SENSe]:CWCDma:RHO:FERRor:TRANge?
Example	CWCD:RHO:FERR:TRAN WIDE CWCD:RHO:FERR:TRAN?
Dependencies/Couplings	No
Preset	NORMal
State Saved	Saved in instrument state.
Instrument S/W Revision	A.01.60 or later

QPSK EVM Related Setting Commands

Measurement Enable/Disable

Allows you to enable or disable QPSK EVM measurement.

Mode	WCDMA
Remote Command	[:SENSe] :CWCDma :EVMQpsk [:ENABLe] OFF ON 0 1 [:SENSe] :CWCDma :EVMQpsk [:ENABLe] ?
Example	CWCD:EVMQ ON CWCD:EVMQ?
Preset	OFF
State Saved	Saved in instrument state.
Range	On Off
Instrument S/W Revision	A.01.60 or later

QPSK EVM Calculation Length

Sets calculation length of QPSK EVM measurement.

See Algorithm Overview for detail.

Mode	WCDMA
Remote Command	[:SENSe] :CWCDma :EVMQpsk :SWEep :LENGth <time> [:SENSe] :CWCDma :EVMQpsk :SWEep :LENGth?
Example	CWCD:EVMQ:SWE:LENG 1ms CWCD:EVMQ:SWE:LENG?
Preset	1.333334ms
State Saved	Saved in instrument state.
Min	66.667us
Max	2.666667ms
Test MIN/MAX/DEF	Yes
Test UP/DOWN	0.0001
Instrument S/W Revision	A.01.60 or later

QPSK EVM Calculation Offset

Sets calculation offset of QPSK EVM measurement. The first part of a step can be affected by a frequency hopping. Specified length of the first portion is discarded if non-zero value is set.

See Algorithm Overview for detail.

Mode	WCDMA
Remote Command	[:SENSE] :CWCDma :EVMQpsk :SWEep :OFFSet <time> [:SENSe] :CWCDma :EVMQpsk :SWEep :OFFSet?
Example	CWCD:EVMQ:SWE:OFFS 100us CWCD:EVMQ:SWE:OFFS?
Preset	0.0
State Saved	Saved in instrument state.
Min	0.0
Max	22.155533ms
Test MIN/MAX/DEF	Yes
Test UP/DOWN	0.0001
Instrument S/W Revision	A.01.60 or later

QPSK EVM Result Selection

Sets the composition of QPSK EVM result block in scalar results. If an item is disabled (off), the item is not shown and not contained in remote results.

The number and the order of this list correspond to QPSK EVM result block in remote result (n = 1).

Mode	WCDMA
Remote Command	[:SENSE] :CWCDma :EVMQpsk :RESult ON OFF 0 1,... [:SENSe] :CWCDma :EVMQpsk :RESult?
Example	CWCD:EVMQ:RES 1,0,0,0,0,0 CWCD:EVMQ:RES?
Preset	1,1,1,1,1,1

State Saved	Saved in instrument state.
Instrument S/W Revision	A.01.60 or later

EVM Result I/Q Offset (QPSK EVM)

Toggles the I/Q origin offset function between Std (standard) and Exclude.

Std: The measurement results for EVM, Rho, and Modulation Accuracy (Rho) error take into account the I/Q origin offset.

Exclude: The measurement results for EVM, Rho, and Modulation Accuracy (Rho) error do not take into account the I/Q origin offset, and the message “EVM excludes I/Q Offset” is displayed in the lower right-hand graph display area.

Turns the automatic mode On or Off, for the I/Q origin offset function.

Exclude: OFF – The measurement results for EVM and Rho do not take into account the I/Q origin offset.

Standard: ON – The measurement results for EVM and Rho take into account the I/Q origin offset.

Mode	WCDMA
Remote Command	:CALCulate:CWCDma:EVMQpsk:IQOffset:INCLude OFF ON 0 1 :CALCulate:CWCDma:EVMQpsk:IQOffset:INCLude?
Example	CALC:CWCD:EVMQ:IQOF:INCL ON CALC:CWCD:EVMQ:IQOF:INCL?
Preset	ON
State Saved	Saved in instrument state.
Instrument S/W Revision	A.01.60 or later

Chip Rate (QPSK EVM)

Sets the chip rate.

Mode	WCDMA
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Remote Command	[:SENSe] :CWCDma :EVMQpsk :CRATe <freq> [:SENSe] :CWCDma :EVMQpsk :CRATe?
Example	CWCD:EVMQ:CRAT 3900000 CWCD:EVMQ:CRAT?
Preset	3.84 MHz
State Saved	Saved in instrument state.
Min	3.456 MHz
Max	4.224 MHz
Test MIN/MAX/DEF	Yes
Test UP/DOWN	1.0 kHz
Instrument S/W Revision	A.01.60 or later

ACP Related Setting Commands

Measurement Enable/Disable

Allows you to enable or disable ACP measurement.

Mode	WCDMA
Remote Command	[:SENSe] :CWCDma :ACPower [:ENABle] OFF ON 0 1 [:SENSe] :CWCDma :ACPower [:ENABle] ?
Example	CWCD:ACP OFF CWCD:ACP?
Preset	ON
State Saved	Saved in instrument state.
Range	On Off
Instrument S/W Revision	A.01.60 or later

ACP Calculation Length

Sets calculation length of ACP measurement.

See Algorithm Overview for detail.

Mode	WCDMA
Remote Command	[:SENSe]:CWCDma:ACPower:SWEep:LENGth <time> [:SENSe]:CWCDma:ACPower:SWEep:LENGth?
Example	CWCD:ACP:SWE:LENG 1ms CWCD:ACP:SWE:LENG?
Preset	91.023us
State Saved	Saved in instrument state.
Min	22.756us
Max	8.738134ms
Test MIN/MAX/DEF	Yes
Test UP/DOWN	0.0001
Instrument S/W Revision	A.01.60 or later

ACP Calculation Offset

Sets calculation offset of ACP measurement. The first part of a step can be affected by a frequency hopping. Specified length of the first portion is discarded if non-zero value is set.

See Algorithm Overview for detail.

Mode	WCDMA
Remote Command	[:SENSe]:CWCDma:ACPower:SWEep:OFFSet <time> [:SENSe]:CWCDma:ACPower:SWEep:OFFSet?
Example	CWCD:ACP:SWE:OFFS 100us CWCD:ACP:SWE:OFFS?
Preset	0.0
State Saved	Saved in instrument state.
Min	0.0

Max	22.199444ms
Test MIN/MAX/DEF	Yes
Test UP/DOWN	0.0001
Instrument S/W Revision	A.01.60 or later

ACP Result Selection

Sets the composition of ACP result block in scalar results. If an item is disabled (off), the item is not shown and not contained in remote results.

The number and the order of this list correspond to ACP result block in remote result (n = 1).

Mode	WCDMA
Remote Command	[:SENSe] :CWCDma:ACPower:RESult ON OFF 0 1,... [:SENSe] :CWCDma:ACPower:RESult?
Example	CWCD:ACP:RES 1,0,0,0,0 CWCD:ACP:RES?
Preset	1,1,1,1,1,0,0,0,0
State Saved	Saved in instrument state.
Instrument S/W Revision	A.01.60 or later

FFT Length

Sets the FFT length.

Mode	WCDMA
Remote Command	[:SENSe] :CWCDma:ACPower:FFT:LENGth <integer> [:SENSe] :CWCDma:ACPower:FFT:LENGth?
Example	CWCD:ACP:FFT:LENG 1024 CWCD:ACP:FFT:LENG?
Notes	This function is available when Meas Method is SINGLE or LIST.

Preset	4096
State Saved	Saved in instrument state.
Min	256
Max	131072
Test MIN/MAX/DEF	Yes
Test UP/DOWN	1
Instrument S/W Revision	A.01.60 or later

Res BW Sets the value of the resolution bandwidth.

Mode	WCDMA
Remote Command	<pre>[:SENSe] :CWCDma:ACPower:BANDwidth[:RESolution] <bandwidth> [:SENSe] :CWCDms:ACPower:BANDwidth[:RESolution]? [:SENSe] :CWCDma:ACPower:BANDwidth[:RESolution]:AUTO ON OFF 1 0 [:SENSe] :CWCDma:ACPower:BANDwidth[:RESolution]:AUTO?</pre>
Example	<pre>CWCD:ACP:BAND 25 kHz CWCD:ACP:BAND? CWCD:ACP:BAND:AUTO ON CWCD:ACP:BAND:AUTO?</pre>
Notes	This function is available when Meas Method is MULTi. This parameter is preset by the Meas Method selection. Preset values are as follows: IBW: 100 kHz IBWR: 27 kHz FAST: 390 kHz You must be in the W-CDMA mode to use this command. Use :INSTrument:SElect to set the mode.
Dependencies/Couplings	The resolution bandwidth is coupled to the video bandwidth based on the video to resolution bandwidth ratio setting if AUTO is selected.

Preset	100 kHz 0
State Saved	Saved in instrument state.
Min	1 Hz
Max	8 MHz
Test MIN/MAX/DEF	Yes
Instrument S/W Revision	A.01.60 or later

Video BW Changes the analyzer post-detection filter (VBW).

Mode	WCDMA
Remote Command	<pre>[:SENSe]:CWCDma:ACPower:BANDwidth:VIDeo <freq> [:SENSe]:CWCDma:ACPower:BANDwidth:VIDeo? [:SENSe]:CWCDma:ACPower:BANDwidth:VIDeo:AUTO OFF ON 0 1 [:SENSe]:CWCDma:ACPower:BANDwidth:VIDeo:AUTO?</pre>
Example	<pre>CWCD:ACP:BAND:VID 1000 CWCD:ACP:BAND:VID? CWCD:ACP:BWID:VID:AUTO ON CWCD:ACP:BWID:VID:AUTO?</pre>
Notes	This function is available when Meas Method is MULTi. The values shown in this table reflect the conditions after a Mode Preset.
Preset	1 MHz OFF
State Saved	Saved in instrument state.
Min	1 Hz
Max	50 MHz
Test UP/DOWN	1, 3, 10...
Instrument S/W Revision	A.01.60 or later

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

Mode	WCDMA
Remote Command	[:SENSe]:CWCDma:ACPower:BANDwidth:SHAPE GAUSSian FLATtop [:SENSe]:CWCDma:ACPower:BANDwidth:SHAPE?
Example	CWCD:ACP:BAND:SHAP GAUS CWCD:ACP:BAND:SHAP?
Notes	This function is available when Meas Method is MULTi.
Preset	GAUSSian
State Saved	Saved in instrument state.
Instrument S/W Revision	A.01.60 or later

Detector Enables you to control the detectors for the current measurement. The following choices are available:

- Auto the detector selected depends on marker functions, trace functions, average type, and the trace averaging function.
- Sample the detector indicates the instantaneous level of the signal at the center of the sweep points represented by each display point.
- Normal the detector determines the peak of the CW-like signals, and it yields alternating maximums and minimums of noise-like signals. This is also referred to as Rosenfell detection.
- Average the detector determines the average of the signal within the sweep points. The averaging method depends upon the Average Type selection (voltage, power or log scales).
- Peak the detector determines the maximum of the signal within the sweep points.
- Negative Peak the detector determines the minimum of the signal within the sweep points.

Mode	WCDMA
Remote Command	[:SENSe]:CWCDma:ACPower:DETECTOR[:FUNCTION] NORMal AVERage POSitive SAMPLE NEGative [:SENSe]:CWCDma:ACPower:DETECTOR[:FUNCTION]?

Example	CWCD:ACP:DET NORM CWCD:ACP:DET?
Notes	This function is available when Meas Method is MULTi. When you manually select a detector (instead of selecting Auto), that detector is used regardless of other analyzer settings. The Sample detector indicates the instantaneous level of the signal at the center of the sweep points represented by each display point. The Normal detector determines the peak of CW-like signals, and it yields alternating maximums and minimums of noise-like signals. This method of detection is also referred to as Rosenfell detection. The Average detector determines the average of the signal within the sweep points. The averaging method is Power Average (RMS). The Peak detector determines the maximum of the signal within the sweep points. The Negative Peak detector determines the minimum of the signal within the sweep points.
Dependencies/Couplings	When the Detector choice is Auto, the detector selected becomes Average, which is the default setting of this measurement.
Preset	AVERage
State Saved	Saved in instrument state.
Range	Normal Average Peak Sample Negative Peak
Instrument S/W Revision	A.01.60 or later

Auto Sets the detector for the currently selected trace to Auto.

Mode	WCDMA
Remote Command	[:SENSe]:CWCDma:ACPower:DETEctor:AUTO ON OFF 1 0 [:SENSe]:CWCDma:ACPower:DETEctor:AUTO?
Example	CWCD:ACP:DET:AUTO ON CWCD:ACP:DET:AUTO?
Notes	This function is available when Meas Method is MULTi.
Dependencies/Couplings	When the Detector choice is Auto, the detector selected becomes Average, which is the default setting of this measurement.
Preset	ON

State Saved	Saved in instrument state.
Instrument S/W Revision	A.01.60 or later

Sweep Time Selects the length of time in which the spectrum analyzer sweeps the displayed frequency span. In swept spans, the sweep time varies from 1 millisecond to 2000 seconds. Additional overhead time, which impacts the sweep rate, is not calculated as part of the sweep time. In fact:

$\text{sweep rate} = \text{span} / \text{sweep time}$

$\text{update rate} = 1 / (\text{sweep time} + \text{overhead})$

$\text{sweep cycle time} = \text{sweep time} + \text{overhead}$

Sweep time is coupled to RBW and VBW, and is impacted by the number of sweep points, so changing those parameters may change the sweep time.

If you increase the sweep time, you increase the length of the time data captured and the number of points measured. You might need to specify a specific sweep speed to accommodate a specific condition in your transmitter. For example, you may have a burst signal and need to measure an exact portion of the burst.

Selecting a specific sweep time may result in a long measurement time since the resulting number of data points may not be the optimum 2n.

Mode	WCDMA
Remote Command	<pre>[:SENSe]:CWCDma:ACPower:SWEep:TIME <time> [:SENSe]:CWCDma:ACPower:SWEep:TIME? [:SENSe]:CWCDma:ACPower:SWEep:TIME:AUTO OFF ON 0 1 [:SENSe]:CWCDma:ACPower:SWEep:TIME:AUTO?</pre>
Example	<pre>CWCD:ACP:SWE:TIME 50 ms CWCD:ACP:SWE:TIME? CWCD:ACP:SWE:TIME:AUTO OFF CWCD:ACP:SWE:TIME:AUTO?</pre>
Notes	This function is available when Meas Method is MULTi.
Preset	29 ms OFF
State Saved	Saved in instrument state.
Min	1 ms

Max	4000 s
Test MIN/MAX/DEF	Yes
Test UP/DOWN	1,1.5,2,3,5,7.5,10 sequence
Instrument S/W Revision	A.01.60 or later

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

Mode	WCDMA
Remote Command	[:SENSe]:CWCDma:ACPower:SWEep:POINTS <integer> [:SENSe]:CWCDma:ACPower:SWEep:POINTS?
Example	CWCD:ACP:SWE:POIN 500 CWCD:ACP:SWE:POIN?
Notes	This function is available when Meas Method is MULTi. Whenever the number of sweep points change: • All trace data is erased • Any traces with Update Off will also go to Display Off (like going from View to Blank in the older analyzers) • Sweep time is re-quantized • Any limit lines that are on will be updated • If averaging/hold is on, averaging/hold starts over
Dependencies/Couplings	Whenever the number of sweep points change the sweep time is re-quantized.
Preset	1001
State Saved	Saved in instrument state.
Min	1
Max	20001
Test MIN/MAX/DEF	Yes
Instrument S/W Revision	A.01.60 or later

Meas Preset

Restores all measurement parameters to their default values.

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

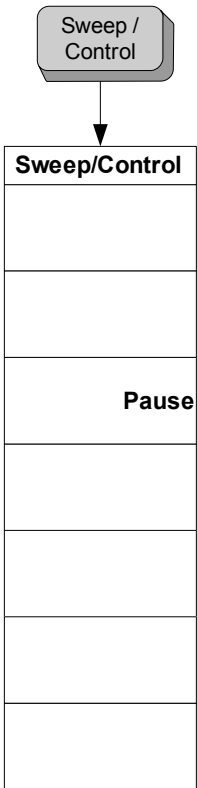
Mode	WCDMA
Remote Command	:CONFigure:CWCDma
Example	CONF:CWCD
Instrument S/W Revision	A.01.60 or later

Peak Search

There is no Peak Search functionality implemented for this measurement.

Sweep/Control

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



SPAN X Scale

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

Trace/Detector

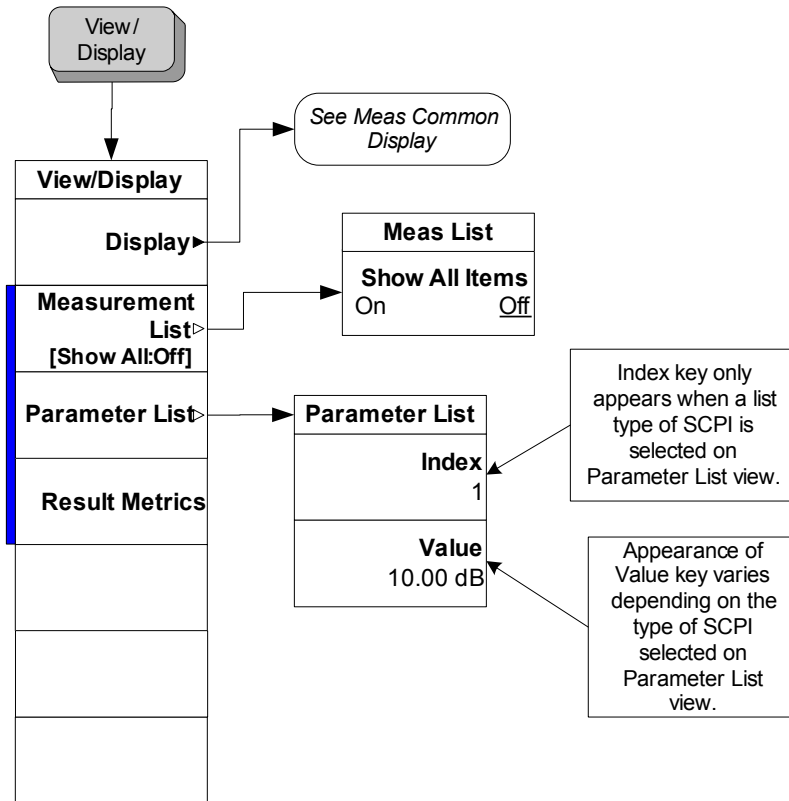
There are no menu keys available in Trace/Detector menu.

Trigger

Selects the trigger source and trigger setup functionality. See the “Measurement Functions” section for trigger setup information.

View/Display

View/Display provides a menu of Displays that allow you to select and set up measurements and display results.



Measurement List

In default, this view shows the current status of enabled measurements, items.

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

Single-Acquisition Combined W-CDMA Measurement
View/Display

CH Freq: 1.000000000 GHz
Trig: Free Run
Atten: 10 dB (Elec 0)

Radio Device: BTS

Measurement	Measurement Item
Rho (Frequency 0)	RMS EVM
	Peak EVM
	Magnitude error
	Phase error
	I/Q Offset
	Frequency error
	Rho
	Peak CDE
	Peak CDE channel number
	Number of active channels
QPSK EVM (Frequency 0)	Time Offset Result
	CPICH Power over a Slot
	Total Power over a Slot
	First Slot Number
	Dpcch Slot Format Detected
	Prach Preamble Signature Detected
	RMS EVM
	Peak EVM
	Magnitude error
	Phase error
ACP (Frequency 0)	Frequency error
	I/Q Offset
	Carrier Power
	-5MHz Offset Rel Power
	-5MHz Offset Abs Power
	+5MHz Offset Rel Power

View/Display

Display▶

Measurement List▶

Parameter List

Result Metrics

MSGSTATUS Burst Not Found

Parameter List

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

50 Ω
AC
SENSE:INT
ALIGN: AUTO

CH Freq: 1.000000000 GHz
Input: RF
Trig: Free Run
Radio Device: BTS

#IFGain: Low
Atten: 10 dB (Elec 0)

Name	SCPI	Value
EVM Result I/Q Offset Limit (QPSK EVM)	:CALCulate:CWCDma:EVMQpsk:IQOffset:INCLude	On
Active Set Threshold	:CALCulate:CWCDma:RHO:ASET:THReshold	0.0 dB
Active Set Threshold Auto	:CALCulate:CWCDma:RHO:ASET:THReshold:AUTO	On
DTX/Burst Detect	:CALCulate:CWCDma:RHO:DTXBurst	Off
EVM Result I/Q Offset Limit	:CALCulate:CWCDma:RHO:IQOffset:INCLude	On
View Selection Number	:DISPlay:CWCDma:VIEW:NSElect	2
View Selection	:DISPlay:CWCDma:VIEW:SElect	Parameter
ACP Measurement State	:SENSe:CWCDma:ACP:Power:ENABLE	On
FFT Length	:SENSe:CWCDma:ACP:Power:FFT:LENGTH	4096
ACP Result Selection	:SENSe:CWCDma:ACP:Power:RESult	List:Boolean[9]
ACP Calc Length	:SENSe:CWCDma:ACP:Power:SWEEP:LENGTH	91.0 μs
ACP Calc Offset	:SENSe:CWCDma:ACP:Power:SWEEP:OFFSet	0.00 s
Step Capture Interval	:SENSe:CWCDma:CAP:Time	5.00 ms
Chip Rate (QPSK EVM)	:SENSe:CWCDma:EVMQpsk:CRATe	3.8400 MHz
QPSK EVM Measurement State	:SENSe:CWCDma:EVMQpsk:ENABLE	Off
QPSK EVM Result Selection	:SENSe:CWCDma:EVMQpsk:RESult	List:Boolean[6]
QPSK EVM Calc Length	:SENSe:CWCDma:EVMQpsk:SWEEP:LENGTH	1.33 ms
QPSK EVM Calc Offset	:SENSe:CWCDma:EVMQpsk:SWEEP:OFFSet	0.00 s
Alpha	:SENSe:CWCDma:FILTer:RRC:ALPHa	0.22
RRC Filter	:SENSe:CWCDma:FILTer:RRC:STATe	On
Gate Recovery	:SENSe:CWCDma:GATE:RTIME	1.00 ms
Gate Source	:SENSe:CWCDma:GATE:SOURce	IMMediate
IFGainAuto	:SENSe:CWCDma:IFGAIN:AUTO:STATe	Off
IFGain	:SENSe:CWCDma:IFGAIN:STATe	Off
Hopping Frequency List	:SENSe:CWCDma:LIST:FREQuency	List:Frequency[12]
Hopping State List	:SENSe:CWCDma:LIST:STATe	List:Boolean[12]
Chip Rate	:SENSe:CWCDma:RHO:CRATe	3.8400 MHz
Rho Measurement State	:SENSe:CWCDma:RHO:ENABLE	On
Frequency Error Tolerance Range	:SENSe:CWCDma:RHO:FERRor:TRANge	NORMal
Multi Channel Estimator	:SENSe:CWCDma:RHO:MCEStimator	Off
Timing Estimation	:SENSe:CWCDma:RHO:MCEStimator:TIMing	GLOBal

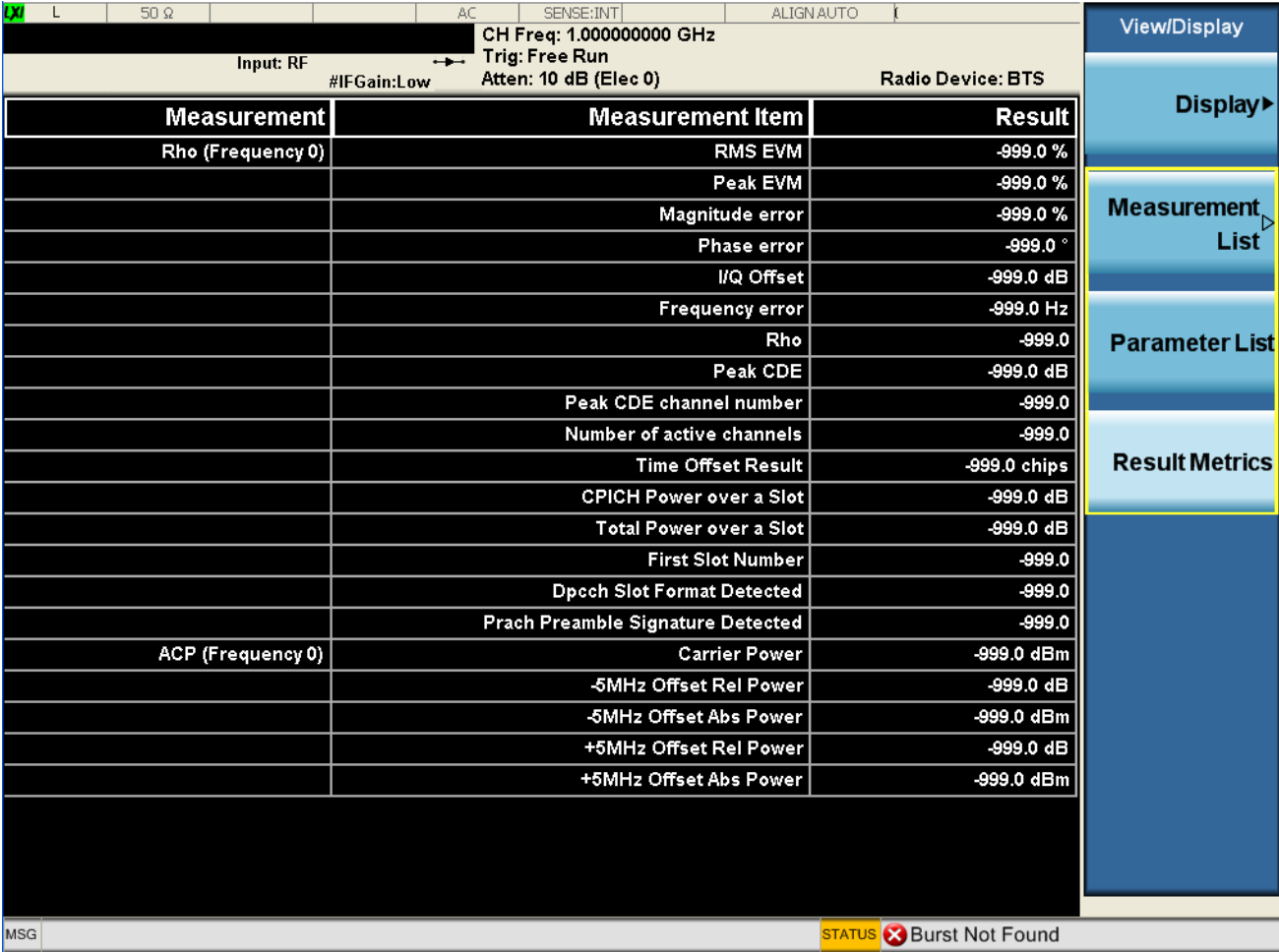
MSG
STATUS
✖ Burst Not Found

View/Display
Display ▶
Measurement List
Parameter List
Result Metrics

Result Metrics

This view shows same results in the same order which remote results(n=1) returns.

Single-Acquisition Combined W-CDMA Measurement
View/Display



Change Title

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

See the “Analyzer Setup Functions” section for details.

Key Path	View/Display, Display, Title
Mode	WCDMA
Remote Command	:DISPlay:CWCDma:ANNotation:TITLe:DATA <string> :DISPlay:CWCDma:ANNotation:TITLe:DATA?
Example	DISP:CWCD:ANN:TITL:DATA “Combined WCDMA” DISP:CWCD:ANN:TITL:DATA?
Preset	Combined WCDMA
State Saved	Saved in instrument state.

Range	Uppercase, Lowercase, Numeric, Symbol
Instrument S/W Revision	A.01.60 or later

View Selection

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

- MLISt – Measruement List view
- PARAmeter – Parameter List view
- RESult - Result Metrics view
-

Key Path	View/Display
Mode	WCDMA
Remote Command	:DISPlay:CWCDma:VIEW[:SElect] MLISt PARAmeter RESult :DISPlay:CWCDma:VIEW[:SElect]?
Example	DISP:CWCD:VIEW RES DISP:CWCD:VIEW?
Preset	RESult
State Saved	Saved in instrument state.
Range	Measurement List Parameter List Result Metrics
Instrument S/W Revision	A.01.60 or later

Show All Items

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

Key Path	View/Display, Measurement List
Mode	WCDMA
Notes	No remote command, only menu key is available.
Preset	OFF

State Saved	Saved in instrument state.
Range	On Off
Instrument S/W Revision	A.01.60 or later

Index

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

Key Path	View/Display, Parameter List
Mode	GSM
Instrument S/W Revision	A.01.60 or later

Value

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

Key Path	View/Display, Parameter List
Mode	GSM
Instrument S/W Revision	A.01.60 or later

3 List Power Step Measurement

The List Power Step measurement performs multiple sweeps using the zero span method across the listed frequencies, employing selected electronic attenuator and sweep point settings. The settings are accessed sequentially and the power measurements taken create a trace from the multiple sweeps. This provides a faster measurement than by using previous methods.

List Power Step

The List Power Step measurement performs multiple sweeps using the zero span method across the listed frequencies, employing selected electronic attenuator and sweep point settings. The settings are accessed sequentially and the power measurements taken create a trace from the multiple sweeps. This provides a faster measurement than by using previous methods.

Key Path	Meas
Instrument S/W Revision	A.01.60 or later

Remote Commands

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

Table 3-1 List Power Step Measurement Remote Results

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

Calculate Results (Query Only)

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

Mode	WCDMA, GSM
Remote Command	:CALCulate:LPSTep:LIST[1] 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50? [RMS] MAXimum MINimum
Example	CALC:LPST:LIST2? MAX
Notes	Query only command For obtaining results efficiently, it is recommended to query this result when analyzer is not sweeping during query. It is generally advisable to be in Single Sweep. ex) Here is a sequence: INIT:CONT 0 Set Parameter INIT *OPC? CALC:LPST:LIST?
Instrument S/W Revision	A.01.60 or later

Amplitude (AMPTD) Y Scale

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

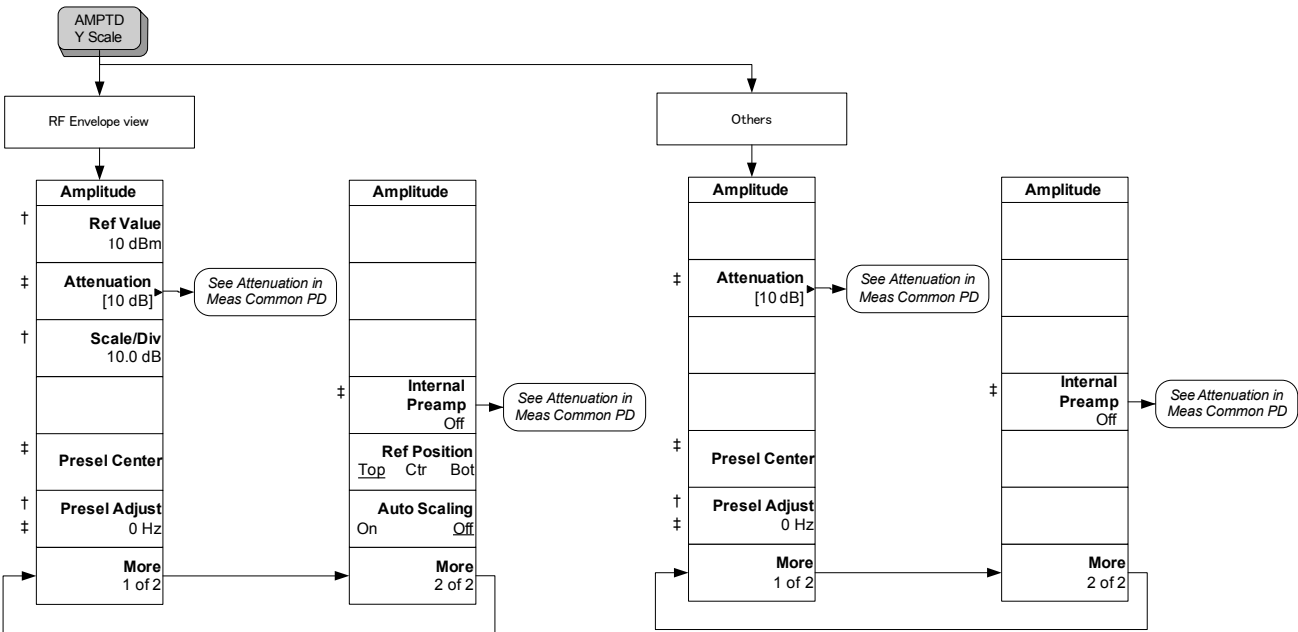


Figure 3-1 AMPTD Y Scale

Ref Value

Sets the absolute power reference.

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

Min	-250.0
Max	250.0
Test MIN/MAX/DEF	Yes
Test UP/DOWN	Y Scale/Div value
Instrument S/W Revision	A.01.60 or later

Attenuation

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

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

Scale/Div

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

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

Test UP/DOWN	Step follows the “1,2,5,10 ... Rule”
Instrument S/W Revision	A.01.60 or later

Presel Center

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

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

Presel Adjust

Allows you to manually adjust the preselector filter frequency to optimize its response to the signal of interest. This function is only available when Presel Center is available

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

Internal Preamp

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

Ref Position

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

Key Path	AMPTD Y Scale, More
Mode	WCDMA, GSM
Remote Command	:DISPlay:LPSTep:VIEW[1]:WINDow[1]:TRACe:Y[:SCALe]:RPOSi tion TOP CENTer BOTTom :DISPlay:LPSTep:VIEW[1]:WINDow[1]:TRACe:Y[:SCALe]:RPOSi tion?
Example	DISP:LPST:VIEW:WIND:TRAC:Y:SCAL:RPOS CENT DISP:LPST:VIEW:WIND:TRAC:Y:SCAL:RPOS?
Preset	TOP

State Saved	Saved in instrument state.
Range	Top Ctr Bot
Instrument S/W Revision	A.01.60 or later

Auto Scaling

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

Key Path	AMPTD Y Scale, More
Mode	WCDMA, GSM
Remote Command	:DISPlay:LPSTep:VIEW[1]:WINDow[1]:TRACe:Y[:SCALe]:COUPle 0 1 OFF ON :DISPlay:LPSTep:VIEW[1]:WINDow[1]:TRACe:Y[:SCALe]:COUPle?
Example	DISP:LPST:VIEW:WIND:TRAC:Y:COUP 0 DISP:LPST:VIEW:WIND:TRAC:Y:COUP?
Dependencies/Couplings	When Auto Scaling is On, and you press the Restart front-panel key, this function automatically determines the scale per division and reference values based on the measurement results. When you manually set a value for the Y Rel Value or Y Scale/Div, this parameter is automatically set to Off.
Preset	OFF
State Saved	Saved in instrument state.
Range	On Off
Instrument S/W Revision	A.01.60 or later

Auto Couple

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

BW

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

Info BW

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

Mode	WCDMA, GSM
Remote Command	[:SENSe] :LPSTep:BANDwidth[:RESolution] <freq> [:SENSe] :LPSTep:BANDwidth[:RESolution] ?
Example	LPST:BAND 10 LPST:BAND?
Notes	You must be in the GSM or WCDMA mode to use this command. Use INSTRument:SElect to set the mode.
Preset	1MHz
State Saved	Saved in instrument state.
Min	10 Hz
Max	8 MHz
Test UP/DOWN	No
Instrument S/W Revision	A.01.60 or later

Filter Type

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

Mode	WCDMA, GSM
Remote Command	[:SENSe] :LPSTep:BANDwidth:SHAPE GAUSSian FLATtop [:SENSe] :LPSTep:BANDwidth:SHAPE?
Example	LPST:BAND:SHAP FLAT LPST:BAND:SHAP?

Preset	GAUS
State Saved	Saved in instrument state.
Range	Gaussian Flattop
Instrument S/W Revision	A.01.60 or later

Video BW

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

Mode	WCDMA, GSM
Remote Command	[:SENSe] :LPSTep:BANDwidth:VIDeo <freq> [:SENSe] :LPSTep:BANDwidth:VIDeo?
Example	LPST:BAND:VID 1MHz LPST:BAND:VID?
Preset	1MHz
State Saved	Saved in instrument state.
Min	1Hz
Max	50MHz
Test MIN/MAX/DEF	Yes
Test UP/DOWN	1e0, 3e0, 1e2, 3e2, 1e3, 3e3, 1e4, 3e4, 1e5, 3e5, 1e6, 3e6, 8e6, 50e6
Instrument S/W Revision	A.01.60 or later

FREQ Channel

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

Input/Output

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

Marker

There are no Markers implemented for this measurement.

Marker Fctn (Function)

There are no Marker Functions implemented for this measurement.

Marker > (Marker To)

There is no Marker To functionality implemented for this measurement.

Meas Setup

Avg/Hold Num

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

Mode	WCDMA, GSM
Remote Command	[:SENSe] :LPSTep:AVERage:COUNT <integer> [:SENSe] :LPSTep:AVERage:COUNT? [:SENSe] :LPSTep:AVERage [:STATe] OFF ON 0 1 [:SENSe] :LPSTep:AVERage [:STATe] ?
Example	LPST:AVER:COUN 3 LPST:AVER:COUN? LPST:AVER ON LPST:AVER?
Notes	You must be in the WCDMA or GSM mode to use this command. Use INSTRument:SELEct to set the mode.
Dependencies/Couplings	When this value is changed, Avg State is set to On.
Preset	10 OFF
State Saved	Saved in instrument state.
Min	1
Max	20001
Test MIN/MAX/DEF	Yes
Test UP/DOWN	Yes
Instrument S/W Revision	A.01.60 or later

Average Mode

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

Mode	WCDMA, GSM
Remote Command	[:SENSe]:LPSTep:AVERage:TCONtrol EXPonential REPeat [:SENSe]:LPSTep:AVERage:TCONtrol?
Example	LPST:AVER:TCON REP LPST:AVER:TCON?
Notes	EXPonential - When Measure is set at Cont, data acquisitions will continue indefinitely. After N averages, exponential averaging is used with a weighting factor of N (the displayed average count stops at N). Exponential averaging weights new data more than old data, which allows tracking of slow-changing signals. The weighting factor N is set using the Averages, Avg Bursts key. REPeat - When Measure is set at Cont, data acquisitions will continue indefinitely. After N averages is reached, all previous result data is cleared and the average count is set back to 1. This is equivalent to being in Measure Single and pressing the Restart key when the Single measurement finishes.
Preset	EXPonential
State Saved	Saved in instrument state.
Instrument S/W Revision	A.01.60 or later

Average Type

Specifies the type of trace and result averaging to use.

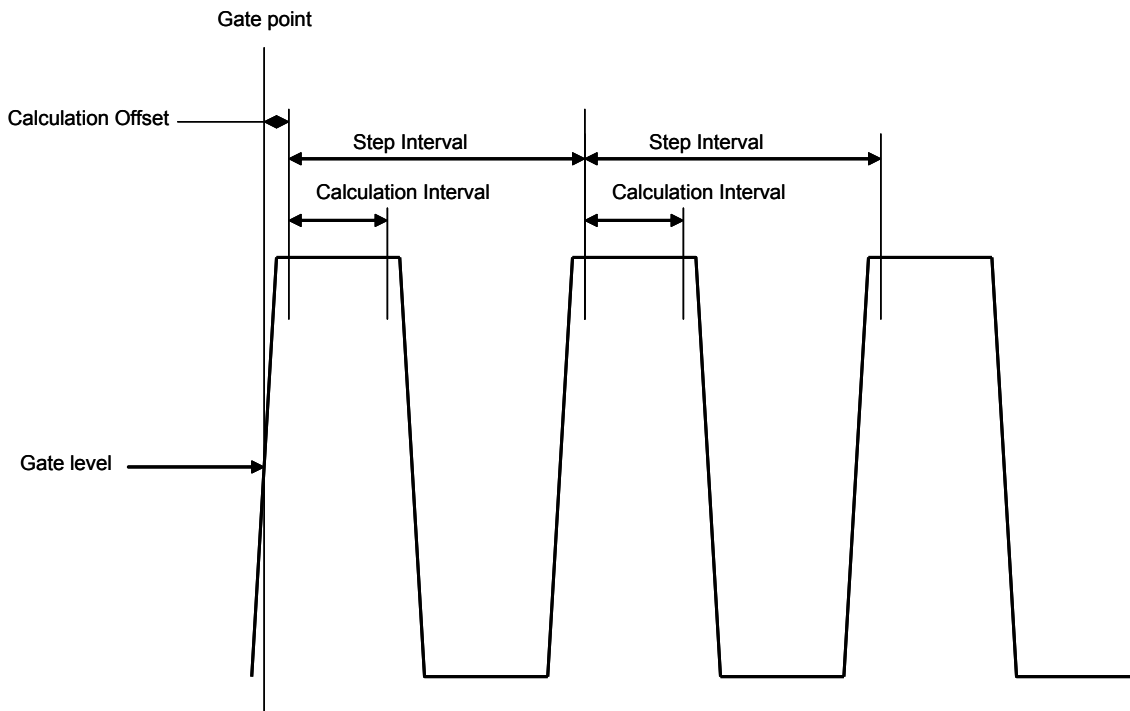
This parameter is valid only for Measure Trace.

Mode	WCDMA, GSM
Remote Command	[:SENSe]:LPSTep:AVERage:TYPE LOG RMS [:SENSe]:LPSTep:AVERage:TYPE?
Example	LPST:AVER:TYPE LOG LPST:AVER:TYPE?

Notes	LOG - simulates the traditional spectrum analyzer type of averaging by averaging the log of the power. RMS - true power averaging that is equivalent to taking the RMS value of the voltage. It is the most accurate type of averaging.
Preset	RMS
State Saved	Saved in instrument state.
Instrument S/W Revision	A.01.60 or later

Calculation Time Setup

Specify the period to be calculated for the swept trace.



Step Interval

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

Mode	WCDMA, GSM
------	------------

Remote Command	<code>[[:SENSe]:LPSTep:SWEep:STEP:TIME <time></code> <code>[[:SENSe]:LPSTep:SWEep:STEP:TIME</code>
Example	<code>LPST:SWE:STEP:TIME 0.001</code> <code>LPST:SWE:STEP:TIME?</code>
Preset	500 us
State Saved	Saved in instrument state.
Min	1 ns
Max	1s
Test MIN/MAX/DEF	Yes
Test UP/DOWN	No
Instrument S/W Revision	A.01.60 or later

Calculation Offset

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

Mode	WCDMA, GSM
Remote Command	[:SENSe]:LPSTep:LIST:SWEep:STEP:OFFSet <time>, ... [:SENSe]:LPSTep:LIST:SWEep:STEP:OFFSet?
Example	LPST:LIST:SWE:STEP:OFFS 0.00005,0.00005 LPST:LIST:SWE:STEP:OFFS?
Preset	0, 0,0,0,0,0,0,0,0,0,0,0,0
State Saved	Saved in instrument state.
Min	0 s
Max	1 s
Test MIN/MAX/DEF	No
Test UP/DOWN	No
Instrument S/W Revision	A.01.60 or later

Calculation Interval

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

Mode	WCDMA, GSM
Remote Command	[[:SENSE]:LPSTep:SWEep:STEP:LENGth <time> [[:SENSE]:LPSTep:SWEep:STEP:LENGth?
Example	LPST:SWE:STEP:LENG 0.00004 LPST:SWE:STEP:LENG?
Preset	250 us
State Saved	Saved in instrument state.
Min	1 ns
Max	1 s
Test MIN/MAX/DEF	Yes
Test UP/DOWN	No
Instrument S/W Revision	A.01.60 or later

List Setup

Number of Steps

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

Mode	WCDMA, GSM
Remote Command	[:SENSe]:LPSTep:LIST:STEP <integer>, ... [:SENSe]:LPSTep:LIST:STEP?
Example	LPST:LIST:STEP 10, 0,10,10,10,10,10,10,10 LPST:LIST:STEP?

Preset	1, 1,1,1,1,1,1,1,1,1,1,1,1,1
State Saved	Saved in instrument state.
Min	1
Max	100
Test MIN/MAX/DEF	No
Test UP/DOWN	No
Instrument S/W Revision	A.01.60 or later

Sweep State

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

Mode	WCDMA, GSM
Remote Command	[:SENSe]:LPSTep:LIST:STATe ON OFF 1 0, ... [:SENSe]:LPSTep:LIST:STATe?
Example	LPST:LIST:STAT 1,1,1,1,0, 0,0,0,0,0,0,0,0,0,0,0,0,0 LPST:LIST:STAT?
Notes	The state of the first list doesn't change to OFF 0.
Preset	1,0, 0,0,0,0,0,0,0,0,0,0,0,0,0,0
State Saved	Saved in instrument state.
Instrument S/W Revision	A.01.60 or later

Sweep Frequency

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

Mode	WCDMA, GSM
------	------------

Remote Command	[:SENSe]:LPSTep:LIST:FREQuency <freq>, ... [:SENSe]:LPSTep:LIST:FREQuency?
Example	LPST:LIST:FREQ 1e9, 2e9, 3e9 LPST:LIST:FREQ?
Notes	The 'Center Frequency' setting under "Freq / Channel" front panel key or [:SENSe]:FREQuency:CENTer overwrites the first frequency in this list. Any values less than 3.6GHz can be set. Note that when Sweep E-ATT has a cycle consisting of n values, then the same Sweep Frequency should be repeated n times. [Example of the combination of Sweep Frequency and E-ATT] N=1 (No cycle) Sweep Frequency 1GHz, 1.5GHz, 2GHz, 2.5GHz, 3GHz, 3.5GHz Sweep E-ATT 20, 20, 20, 20, 20, 20 N=3 cycle Sweep Frequency 1GHz, 1GHz, 1GHz, 2GHz, 2GHz, 2GHz, 3GHz, 3GHz, 3GHz Sweep E-ATT 20, 0, 20, 20, 0, 20, 20, 0, 20 N=5 cycle Sweep Frequency 1GHz, 1GHz, 1GHz, 1GHz, 1GHz, 2GHz, 2GHz, 2GHz, 2GHz, 2GHz Sweep E-ATT 20, 0, 20, 20, 0, 20, 0, 20, 20, 0 N=10 cycle Sweep Frequency 1GHz, 1GHz, 1GHz, 1GHz, 1GHz, 1GHz, 1GHz, 1GHz, 1GHz, 1GHz, 2GHz, 2GHz, 2GHz, 2GHz, 2GHz, 2GHz, 2GHz, 2GHz, 2GHz, 2GHz Sweep E-ATT 20, 0, 20, 0, 0, 20, 20, 20, 20, 0, 20, 0, 20, 0, 0, 20, 20, 20, 0

[illegible]

Sweep Time

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

[illegible]

[illegible]

Sweep E-ATT

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

Mode	WCDMA, GSM
Remote Command	[:SENSe]:LPSTep:LIST:EATTen <rel_ampl>, ... [:SENSe]:LPSTep:LIST:EATTen
Example	LPST:LIST:EATT 20,0,20,0,20,0,20,0 LPST:LIST:EATT?
Notes	Either 20dB or 0 dB can be set for each value. When Sweep E-ATT has a cycle consisting of n values, then the same Sweep Frequency should be repeated n times. See examples in Notes of Sweep Frequency.
Preset	20dB,0dB,20dB,0dB,20dB,0dB,20dB,0dB,20dB,0dB,20dB,0dB,20dB, 0dB,20dB,0dB,20dB,0dB,20dB,0dB,20dB,0dB,20dB,0dB,20dB,0dB,2 0dB,0dB,20dB,0dB,20dB,0dB,20dB,0dB,20dB,0dB,20dB,0dB,20dB,0 dB,20dB,0dB,20dB,0dB,20dB,0dB,20dB,0dB,20dB,0dB
State Saved	Saved in instrument state.
Min	0
Max	20
Test MIN/MAX/DEF	No
Test UP/DOWN	No
Instrument S/W Revision	A.01.60 or later

Gate Source

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

[illegible]

Gate Recovery Time

It defines the recovery time until next sweep starts.

[illegible]

IF Gain

IF Gain Auto

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

1. The input attenuator is set to 0 dB
 2. The preamp is turned On and the frequency range is under 3.6 GHz
- For other settings, Auto sets the IF Gain to Low Gain.

Mode	WCDMA, GSM
Remote Command	[:SENSE] :LPSTep:IF:GAIN:AUTO[:STATe] ON OFF 1 0 [:SENSE] :LPSTep:IF:GAIN:AUTO[:STATe] ?
Example	LPST:IF:GAIN:AUTO ON LPST:IF:GAIN:AUTO?
Preset	ON
State Saved	Saved in instrument state.
Range	On Off
Instrument S/W Revision	A.01.60 or later

IF Gain State

Selects the range of IF gain.

Mode	WCDMA, GSM
Remote Command	[:SENSE] :LPSTep:IF:GAIN[:STATe] AUTOrange LOW HIGH [:SENSE] :LPSTep:IF:GAIN[:STATe] ?
Example	LPST:IF:GAIN HIGH LPST:IF:GAIN?
Notes	AUTO – slower follows signals LOW – best for large signals HIGH – best noise level
Preset	AUTOrange
State Saved	Saved in instrument state.
Range	Autorange Low High
Instrument S/W Revision	A.01.60 or later

Meas Preset

Restores all the measurement parameters to their default values.

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

Mode	WCDMA, GSM
Remote Command	:CONFigure:LPSTep
Example	CONF:LPST
Notes	You must be in the WCDMA or GSM mode to use this command. Use INSTRument:SElect to set the mode.
Instrument S/W Revision	A.01.60 or later

Trigger

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

Sweep/Control

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

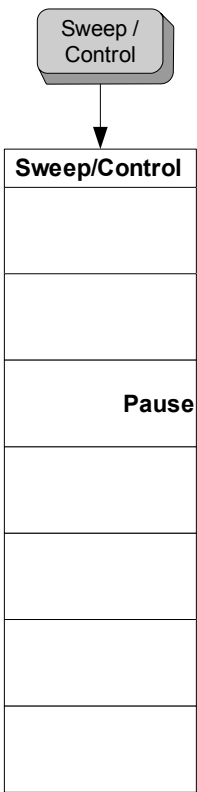


Figure 14-1Sweep/Control

Points

Sets the number of points per sweep, from 1 to 30001. The sweep time and calculation time resolution setting will depend on the number of points selected.

Mode	WCDMA, GSM
Remote Command	[:SENSe] :LPSTep:SWEep:POINts <integer> [:SENSe] :LPSTep:SWEep:POINts
Example	LPST:SWE:POIN 1005 LPST:SWE:POIN?

Notes	Whenever the number of sweep points change: • All trace data is erased • Any traces with Update Off will also go to Display Off (like going from View to Blank in the older analyzers) • Sweep time is re-quantized • Any limit lines that are on will be updated If averaging/hold is on, averaging/hold starts over.
Dependencies/Couplings	Whenever the number of sweep points change the sweep time is re-quantized.
Preset	1001
State Saved	Saved in instrument state.
Min	100
Max	20001
Test MIN/MAX/DEF	Yes
Instrument S/W Revision	A.01.60 or later

Peak Search

There is no Peak Search functionality implemented for this measurement

Source

There is no Source functionality for this application.

SPAN X Scale

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

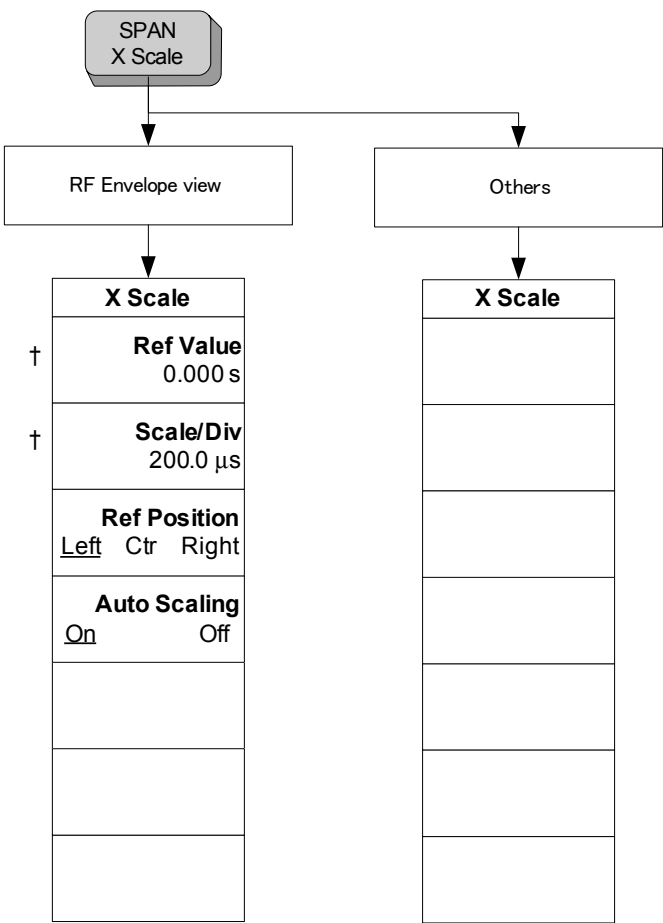


Figure 17-1 SPAN X Scale

Ref Value

Allows you to set the display X reference value.

Key Path	SPAN X Scale
Mode	WCDMA, GSM
Remote Command	:DISPlay:LPSTep:VIEW[1]:WINDow[1]:TRACe:X[:SCALe]:RLEVe l <time> :DISPlay:LPSTep:VIEW[1]:WINDow[1]:TRACe:X[:SCALe]:RLEVe l?

Example	DISP:LPST:VIEW:WIND:TRAC:X:RLEV 1 DISP:LPST:VIEW:WIND:TRAC:X:RLEV?
Notes	If X Auto Scaling is On, this value is automatically determined by the measurement result. When a value is set manually, X Auto Scaling is automatically set to Off.
Dependencies/Couplings	See Notes
Preset	Automatically calculated
State Saved	Saved in instrument state.
Min	–1s
Max	10s
Test MIN/MAX/DEF	MIN MAX
Test UP/DOWN	200.0 us
Instrument S/W Revision	A.01.60 or later

Scale/Div

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

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

Max	1.00 s
Test MIN/MAX/DEF	MIN MAX
Test UP/DOWN	Step follows the “1,2,5,10 ... Rule”
Instrument S/W Revision	A.01.60 or later

Ref Position

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

Key Path	SPAN X Scale
Mode	WCDMA, GSM
Remote Command	:DISPlay:LPSTep:VIEW[1]:WINDow[1]:TRACe:X[:SCALe]:RPOSi tion LEFT CENTer RIGHT :DISPlay:LPSTep:VIEW[1]:WINDow[1]:TRACe:X[:SCALe]:RPOSi tion?
Example	DISP:LPST:VIEW:WIND:TRAC:X:RPOS LEFT DISP:LPST:VIEW:WIND:TRAC:X:RPOS?
Preset	LEFT
State Saved	Saved in instrument state.
Range	Left Ctr Right
Instrument S/W Revision	A.01.60 or later

Auto Scaling

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

Key Path	SPAN X Scale
Mode	WCDMA, GSM

Remote Command	:DISPlay:LPSTep:VIEW[1]:WINDow[1]:TRACe:X[:SCALe]:COUPl e 0 1 OFF ON :DISPlay:LPSTep:VIEW[1]:WINDow[1]:TRACe:X[:SCALe]:COUPl e?
Example	DISP:LPST:VIEW:WIND:TRAC:X:COUP OFF DISP:LPST:VIEW:WIND:TRAC:X:COUP?
Notes	Upon pressing the Restart front-panel key, or Restart softkey under the Meas Control menu, the scale coupling function automatically determines the scale per division and reference values, based on the measurement results, if this parameter is set to On. When you manually set a value to either X Rel Value or X Scale/Div, X Auto Scaling is automatically set to Off.
Dependencies/Couplings	See Notes
Preset	ON
State Saved	Saved in instrument state.
Range	On Off
Instrument S/W Revision	A.01.60 or later

Trace/Detector

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

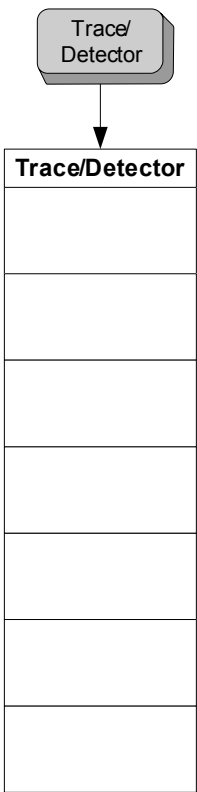


Figure 18-1 Trace/Detector

Detector

Selects a detector.

Mode	WCDMA, GSM
Remote Command	[:SENSe]:LPSTep:DETEctor[:FUNction] AVERage NEGative SAMPle NORMal POSitive [:SENSe]:LPSTep:DETEctor[:FUNction]?
Example	LPST:DET NEG LPST:DET?
Preset	AVERage
State Saved	Saved in instrument state.

List Power Step Measurement
Trace/Detector

Test MIN/MAX/DEF	No
Instrument S/W Revision	A.01.60 or later

View Display

The View/Display menu provides access to many settings and results for the List Power Step measurement.

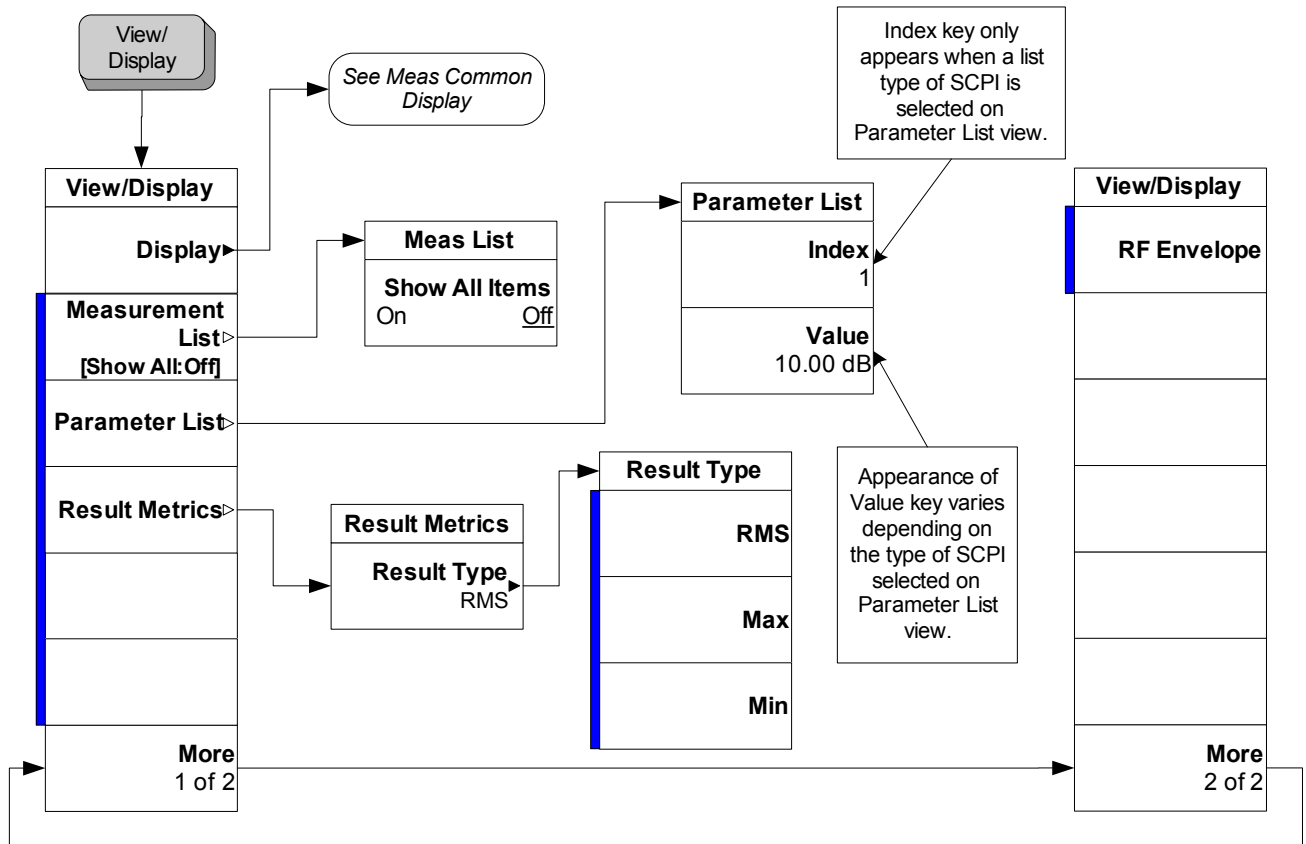


Figure 19-1 View/Display

Display

Change Title

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

See the “View Display ” section in your mode User's and Programmer's Reference for details.

Key Path

View/Display, Display, Title

Mode	WCDMA, GSM
Remote Command	:DISPlay:LPSTep:ANNotation:TITLe:DATA <string> :DISPlay:LPSTep:ANNotation:TITLe:DATA?
Example	DISP:LPST:ANN:TITL:DATA "List Power Step" DISP:LPST:ANN:TITL:DATA?
Preset	List Power Step
State Saved	Saved in instrument state.
Range	Uppercase, Lowercase, Numeric, Symbol
Instrument S/W Revision	A.01.60 or later

Measurement List

This view shows the results of currently enabled measurements.

If “Show All Items” parameter is enabled from the soft key, all available measurements and results are displayed. When a measurement is disabled, the measurement name and results for the disabled measurement are grayed out.

L		50 Ω	AC	SENSE:INT	ALIGN: AUTO	CH Freq: 935.200 000 MHz (ARFCN: 1)	Radio Band: P-GSM
CH Freq 935.200000 MHz		Input: RF	IF Gain: High	Trig: Free Run	Atten: 10 dB (Elec 0)	Burst: TCH&CCH	
BTS							
Measurement	Measurement Item						
Trace Power	Sample Interval						
	Mean Power						
	Mean Power Averaged						
	Sweep Points						
	Peak to Mean						
	Maximum Power						
	Minimum Power						
Sweep List 1	Step Power 1						
	Step Power 2						
	Step Power 3						
	Step Power 4						
	Step Power 5						
	Step Power 6						
	Step Power 7						
	Step Power 8						
	Step Power 9						
	Step Power 10						
	Step Power 11						
	Step Power 12						
	Step Power 13						
	Step Power 14						
	Step Power 15						
	Step Power 16						
	Step Power 17						
	Step Power 18						
	Step Power 19						
	Step Power 20						
	Step Power 21						
	Step Power 22						
MSG						STATUS	

- View/Display
- Display▶
- Measurement List▶
- Parameter List
- Result Metrics▶
- More 1 of 2

Parameter List

This screen shows the name, remote commands and values of all available commands for the current measurement. You can verify and change values in the table by using front panel keys or a mouse and keyboard.

Name	SCPI	Value
LPS_ViewTypeNum	:DISPlay:LPSTep:VIEW:NSElect	4
LPS_ViewType	:DISPlay:LPSTep:VIEW:SElect	PARAMeter
Auto Scaling	:DISPlay:LPSTep:VIEW1:WINDow:TRACe:X:SCALe:COUPle	On
X Scale/Div	:DISPlay:LPSTep:VIEW1:WINDow:TRACe:X:SCALe:PDIVision	1.000 ms
X Ref	:DISPlay:LPSTep:VIEW1:WINDow:TRACe:X:SCALe:RLEVel	0.000 s
LPS_XRefPosition_RfEnv	:DISPlay:LPSTep:VIEW1:WINDow:TRACe:X:SCALe:RPOSITION	Left
Auto Scaling	:DISPlay:LPSTep:VIEW1:WINDow:TRACe:Y:SCALe:COUPle	Off
Scale/Div	:DISPlay:LPSTep:VIEW1:WINDow:TRACe:Y:SCALe:PDIVision	10.00 dB
Ref Value	:DISPlay:LPSTep:VIEW1:WINDow:TRACe:Y:SCALe:RLEVel	10.00 dBm
LPS_YRefPosition_RfEnv	:DISPlay:LPSTep:VIEW1:WINDow:TRACe:Y:SCALe:RPOSITION	Top
ARFCN	:SENSe:CHANnel:ARFCn	1
Burst Type	:SENSe:CHANnel:BURSt	NORMAL
Time Slot	:SENSe:CHANnel:SLOT	0
Time Slot State	:SENSe:CHANnel:SLOT:AUTO	Off
TSC	:SENSe:CHANnel:TSCode	0
TSC Auto Detection	:SENSe:CHANnel:TSCode:AUTO	On
CH Freq	:SENSe:FREQuency:CENTer	935.200000 MHz
LPS_AdcDitherAuto	:SENSe:LPSTep:ADC:DITHer:AUTO:STATE	Off
LPS_AdcDither	:SENSe:LPSTep:ADC:DITHer:STATE	Off
Avg/Hold Number	:SENSe:LPSTep:AVERAge:COUNT	10
Average State	:SENSe:LPSTep:AVERAge:STATE	Off
Average Mode	:SENSe:LPSTep:AVERAge:TCONTROL	Exponential
Average Type	:SENSe:LPSTep:AVERAge:TYPE	Rms
Info BW	:SENSe:LPSTep:BANDwidth:RESolution	1.0000 MHz
LPS_IFFilterType	:SENSe:LPSTep:BANDwidth:SHAPE	Gaussian
VBW	:SENSe:LPSTep:BANDwidth:VIDeo	1.0000 MHz
Detector	:SENSe:LPSTep:DETECTOR:FUNCTION	AVERAge
IFGainAuto	:SENSe:LPSTep:IFGAIN:AUTO:STATE	On
LPS_IFGain	:SENSe:LPSTep:IFGAIN:STATE	Autorange
E-ATT List	:SENSe:LPSTep:LIST:EATTen	List:Amplitude[50]
Frequency List	:SENSe:LPSTep:LIST:FREQuency	List:Frequency[50]

View/Display
 Display ▶
 Measurement List
 Parameter List
 Result Metrics ▶
 More
 1 of 2

MSG STATUS

Result Metrics

This screen displays measurement results in the same order as they are returned by the remote results(n=1) query.

T 50 Ω
AC SENSE:EXT
ALIGN PARTIAL
03:28:04 PM May 29, 2008

CH Freq 1.000000000 GHz
CH Freq: 1.000 000 000 GHz (ARFCN: > 124)
Radio Band: P-GSM

Input: RF
BTS IFGain:High
Trig: External1
#Atten: 30 dB (Elec 20)
Burst: TCH&CCH

Measurement	Measurement Item	Result
Trace Power	Sample Interval	10.000 μs
	Mean Power	-10.992 dBm
	Mean Power Averaged	-10.992 dBm
	Sweep Points	7345
	Peak to Mean	11.255 dB
	Maximum Power	0.26297 dBm
	Minimum Power	-205.56 dBm
Sweep List 1	Step Power 1	0.16 dBm
	Step Power 2	-2.06 dBm
	Step Power 3	-4.04 dBm
	Step Power 4	-6.06 dBm
	Step Power 5	-8.05 dBm
Sweep List 2	Step Power 6	-10.02 dBm
	Step Power 1	-12.06 dBm
	Step Power 2	-14.04 dBm
	Step Power 3	-16.04 dBm
	Step Power 4	-18.01 dBm
	Step Power 5	-20.01 dBm
	Step Power 6	-22.03 dBm
	Step Power 7	-24.02 dBm
	Step Power 8	-26.01 dBm
	Step Power 9	-28.04 dBm
Sweep List 3	Step Power 10	-30.05 dBm
	Step Power 1	-0.05 dBm

MSG
STATUS

View/Display

Display

Measurement List

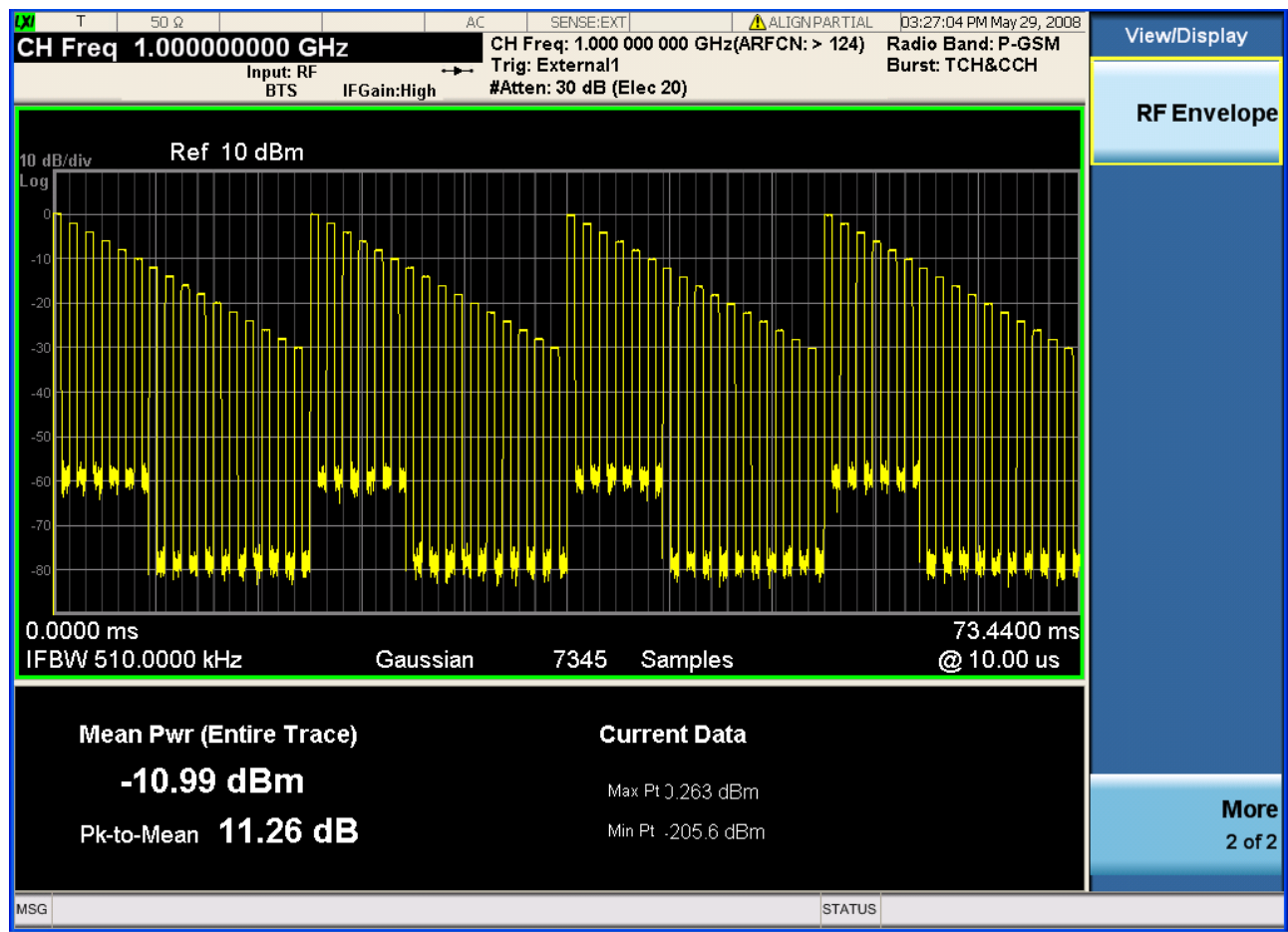
Parameter List

Result Metrics

More
1 of 2

RF Envelope

This view shows a time-domain magnitude trace that is connected multiple gated sweeps by setting of List Setup parameters. The gray vertical bars show the calculation period of related power results.



Trace Window

Corresponding Trace yellow – n=2

Results Window

Name	Corresponding Results	Display Format
Meas Pwr (Entire Trace)	n=1 2nd Meas power across the entire trace in dBm	XX.XX dBm
Pk-to-Mean	n=1 5th The ratio of the maximum signal level to the mean power in dB.	XX.XX dB
Current Data Max	n=1 6th Maximum value of the most recently acquired data in dBm	XX.XX dBm
Current Data Min	n=1 7th Minimum value of the most recently acquired data in dBm	XX.XX dBm

View Selection Remote Commands

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

- MLISt – Measurement List view
- PARameter – Parameter List view
- RESult - Result Metrics view
- RFENvelope - RF Envelope view
-

Key Path	View/Display
Mode	WCDMA, GSM
Remote Command	:DISPlay:LPSTep:VIEW[:SElect] MLISt PARameter RESult RFENvelope :DISPlay:LPSTep:VIEW[:SElect]?
Example	DISP:LPST:VIEW RES DISP:LPST:VIEW?
Preset	RESult
State Saved	Saved in instrument state.
Range	Measurement List Parameter List Result Metrics RF Envelope

Instrument S/W Revision A.01.60 or later

Show All Items

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

Key Path	View/Display, Measurement List
Mode	GSM
Preset	OFF
State Saved	Saved in instrument state.
Range	On Off
Instrument S/W Revision	A.01.60 or later

Index

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

Key Path	View/Display, Parameter List
Mode	GSM
Instrument S/W Revision	A.01.60 or later

Value

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

Key Path	View/Display, Parameter List
----------	-------------------------------------

Mode	GSM
Instrument S/W Revision	A.01.60 or later

Result Type

Allows you to choose type of power displayed in the Result Metrics view.

Key Path	Diplay/View, Result Metrics
Mode	WCDMA, GSM
Remote Command	:DISPlay:LPSTep:VIEW:RESType RMS MAXimum MINimum :DISPlay:LPSTep:VIEW:RESType?
Example	DISP:LPST:VIEW:REST MAX DISP:LPST:VIEW:REST?
Preset	RMS
State Saved	Saved in instrument state.
Range	RMS Max Min
Instrument S/W Revision	A.01.60 or later