

Programming Commands

Agilent Technologies ESA-E Series Spectrum Analyzers Bluetooth™ Measurement Personality

This manual provides documentation for the following instruments:

ESA-E Series

E4402B (9 kHz - 3.0 GHz)
E4404B (9 kHz - 6.7 GHz)
E4405B (9 kHz - 13.2 GHz)
E4407B (9 kHz - 26.5 GHz)



Manufacturing Part Number: E4402-90092

Supersedes: E4402-90083

Printed in USA

May 2003

© Copyright 2001 - 2003 Agilent Technologies, Inc.

Notice

The information contained in this document is subject to change without notice.

Agilent Technologies makes no warranty of any kind with regard to this material, including but not limited to, the implied warranties of merchantability and fitness for a particular purpose. Agilent Technologies shall not be liable for errors contained herein or for incidental or consequential damages in connection with the furnishing, performance, or use of this material.

Warranty

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

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

Agilent Technologies warrants that its software and firmware designated by Agilent Technologies for use with an instrument will execute its programming instructions when properly installed on that instrument. Agilent Technologies does not warrant that the operation of the instrument, or software, or firmware will be uninterrupted or error-free.

LIMITATION OF WARRANTY

The foregoing warranty shall not apply to defects resulting from improper or inadequate maintenance by Buyer, Buyer-supplied software or interfacing, unauthorized modification or misuse, operation outside of the environmental specifications for the product, or improper site preparation or maintenance.

NO OTHER WARRANTY IS EXPRESSED OR IMPLIED. AGILENT TECHNOLOGIES SPECIFICALLY DISCLAIMS THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.

EXCLUSIVE REMEDIES

THE REMEDIES PROVIDED HEREIN ARE BUYER'S SOLE AND EXCLUSIVE REMEDIES. AGILENT TECHNOLOGIES SHALL NOT BE LIABLE FOR ANY DIRECT, INDIRECT, SPECIAL, INCIDENTAL, OR CONSEQUENTIAL DAMAGES, WHETHER BASED ON CONTRACT, TORT, OR ANY OTHER LEGAL THEORY.

Safety Information

The following safety notes are used throughout this manual. Familiarize yourself with these notes before operating this instrument.

WARNING **Warning denotes a hazard. It calls attention to a procedure which, if not correctly performed or adhered to, could result in injury or loss of life. Do not proceed beyond a warning note until the indicated conditions are fully understood and met.**

CAUTION Caution denotes a hazard. It calls attention to a procedure that, if not correctly performed or adhered to, could result in damage to or destruction of the instrument. Do not proceed beyond a caution sign until the indicated conditions are fully understood and met.

WARNING **This is a Safety Class 1 Product (provided with a protective earth ground incorporated in the power cord). The mains plug shall be inserted only in a socket outlet provided with a protected earth contact. Any interruption of the protective conductor inside or outside of the product is likely to make the product dangerous. Intentional interruption is prohibited.**

WARNING **No operator serviceable parts inside. Refer servicing to qualified personnel. To prevent electrical shock do not remove covers.**

CAUTION Always use the three-prong AC power cord supplied with this product. Failure to ensure adequate grounding may cause product damage.

Bluetooth and the Bluetooth logos are trademarks owned by Bluetooth SIG, Inc., U.S.A. and licensed to Agilent Technologies, Inc.

Contents

1. Programming Command

Cross-References

Functional Index to SCPI Subsection	18
---	----

2. Language Reference

ABORt Subsystem	22
Abort Command	22
CALCulate Subsystem	23
ACP - Limits	23
Carrier Frequency Drift Limit Commands	24
Test Current Results Against all Limits	25
Initial Carrier Frequency Tolerance (ICFT) Limit Commands	26
Modulation Characteristics Limit Commands	27
Output Power Limit Commands	28
Output Spectrum Bandwidth Limit Commands	30
CONFigure Subsystem	31
FETCh Subsystem	32
INITiate Subsystem	33
Continuous or Single Measurements	33
Take New Data Acquisitions	33
Pause the Measurement	34
Restart the Measurement	34
Resume the Measurement	34
INSTRument Subsystem	35
Select Application by Number	35
Select Application	36
MEASure Group of Commands	37
Measure Commands	37
Configure Commands	38
Fetch Commands	38
Read Commands	39
Adjacent Channel Power (ACP) Measurement	40
Carrier Frequency Drift Measurement	41
Initial Carrier Frequency Tolerance Measurement	42
Modulation Characteristics Measurement	43
Monitor Band/Channel Measurement	44
Modulation Overview Measurement	45
Output Power Measurement	46
Output Spectrum Bandwidth Measurement	47
MMEMory Subsystem	48
Store a Measurement Results in a File	48
READ Subsystem	49
SENSE Subsystem	50
Adjacent Channel Power (ACP) Measurement	50
Carrier Frequency Drift Measurement	53
Channel Commands	57
Signal Corrections Commands	58
Default Reset	59
Maximum Deviation	59

Frequency Commands	60
Initial Carrier Frequency Tolerance Measurement	62
Modulation Characteristics Measurement	66
Monitor Band/Channel Measurement	72
Modulation Overview Measurement	81
Output Power Measurement	84
Output Spectrum Bandwidth Measurement	90
Packet Commands	95
RF Power Commands	97
Radio Standards Commands	99
Synchronization Commands	100
TRIGger Subsystem	101
External Trigger Delay	101
External Trigger Slope	101
RF Burst Trigger Delay	102
RF Burst Trigger Level	102
Video Trigger Delay	103
Video Trigger Level Amplitude	103

Commands

Alphabetical Listing

:ABORt.....	22
:CALCulate:ACP:LIMit:FAR:UPPer[:DATA] <real number>	23
:CALCulate:ACP:LIMit:FAR:UPPer[:DATA]?	23
:CALCulate:ACP:LIMit:NEAR:UPPer[:DATA] <real number>.....	23
:CALCulate:ACP:LIMit:NEAR:UPPer[:DATA]?	23
:CALCulate:CFDRift:LIMit:DH1 DH3 DH5:LOWer[:DATA]<freq>.....	24
:CALCulate:CFDRift:LIMit:DH1 DH3 DH5:LOWer[:DATA]?	24
:CALCulate:CFDRift:LIMit:DH1 DH3 DH5:UPPer[:DATA]<freq>	24
:CALCulate:CFDRift:LIMit:DH1 DH3 DH5:UPPer[:DATA]?	24
:CALCulate:CFDRift:LIMit:MDRate:LOWer[:DATA]<freq>	25
:CALCulate:CFDRift:LIMit:MDRate:LOWer[:DATA]?	25
:CALCulate:CFDRift:LIMit:MDRate:UPPer[:DATA]<freq>.....	25
:CALCulate:CFDRift:LIMit:MDRate:UPPer[:DATA]?	25
:CALCulate:CLIMits:FAIL?	25
:CALCulate:ICFTol:LIMit:LOWer[:DATA]<freq>	26
:CALCulate:ICFTol:LIMit:LOWer[:DATA]?	26
:CALCulate:ICFTol:LIMit:UPPer[:DATA]<freq>	26
:CALCulate:ICFTol:LIMit:UPPer[:DATA]?	26
:CALCulate:MCHar:LIMit:DF1avg:LOWer[:DATA]<freq>	27
:CALCulate:MCHar:LIMit:DF1avg:LOWer[:DATA]?	27
:CALCulate:MCHar:LIMit:DF1avg:UPPer[:DATA]<freq>.....	27
:CALCulate:MCHar:LIMit:DF1avg:UPPer[:DATA]?	27
:CALCulate:MCHar:LIMit:RATio:LOWer[:DATA]<real number, %>.....	27
:CALCulate:MCHar:LIMit:RATio:LOWer[:DATA]?	27
:CALCulate:OPower:LIMit:PC1 PC2 PC3:AVERage: LOWer[:DATA]<dBm>	29
:CALCulate:OPower:LIMit:PC1 PC2 PC3:AVERage:LOWer[:DATA]?.....	29
:CALCulate:OPower:LIMit:PC1 PC2 PC3:AVERage [:UPPer[:DATA]<dBm>	28
:CALCulate:OPower:LIMit:PC1 PC2 PC3:AVERage[:UPPer[:DATA]?	28
:CALCulate:OPower:LIMit:PEAK[:UPPer[:DATA]<dBm>	29
:CALCulate:OPower:LIMit:PEAK[:UPPer[:DATA]?	29

Commands

Alphabetical Listing

:CALCulate:OSBWidth:LIMit[:UPPer][:DATA]<freq>	30
:CALCulate:OSBWidth:LIMit[:UPPer][:DATA]?	30
:CONFigure:<measurement>	38
:CONFigure:ACP	40
:CONFigure:CFDRift	41
:CONFigure:ICFTol	42
:CONFigure:MCHar	43
:CONFigure:MONitor	44
:CONFigure:MOVerview	45
:CONFigure:OPOWer	46
:CONFigure:OSBWidth	47
:FETCh:<measurement>[n]?	38
:FETCh:ACP[n]?	40
:FETCh:CFDRift[n]?	41
:FETCh:ICFTol[n]?	42
:FETCh:MCHar[n]?	43
:FETCh:MONitor[n]?	44
:FETCh:MOVerview[n]?	45
:FETCh:OPOWer[n]?	46
:FETCh:OSBWidth[n]?	47
:INITiate:CONTInuous OFF ON 0 1	33
:INITiate:CONTInuous?	33
:INITiate:PAUSE	34
:INITiate:REStart	34
:INITiate:RESume	34
:INITiate[:IMMediate]	33
:INSTrument:NSElect <integer>	35
:INSTrument:NSElect?	35
:INSTrument[:SElect] 'SA' 'GSM' 'CDMA' 'PNOISE' 'BLUETOOTH'	36
:INSTrument[:SElect]?	36

Commands

Alphabetical Listing

:MEASure:<measurement>[n]?	37
:MEASure:ACP[n]?	40
:MEASure:CFDRift[n]?	41
:MEASure:ICFTol[n]?	42
:MEASure:MCHar[n]?	43
:MEASure:MONitor[n]?	44
:MEASure:MOVerview[n]?	45
:MEASure:OPOWer[n]?	46
:MEASure:OSBWidth[n]?	47
:MMEMory:STORE:RESults filename.csv	48
:READ:<measurement>[n]?	39
:READ:ACP[n]?	40
:READ:CFDRift[n]?	41
:READ:ICFTol[n]?	42
:READ:MCHar[n]?	43
:READ:MONitor[n]?	44
:READ:MOVerview[n]?	45
:READ:OPOWer[n]?	46
:READ:OSBWidth[n]?	47
:TRIGger:RFBurst:LEVel <dB>	102
:TRIGger[:SEQuence]:EXTErnal:DELAy <time>	101
:TRIGger[:SEQuence]:EXTErnal:DELAy?	101
:TRIGger[:SEQuence]:EXTErnal:SLOPe NEGative POSitive	101
:TRIGger[:SEQuence]:EXTErnal:SLOPe?	101
:TRIGger[:SEQuence]:RFBurst:DELAy <time>	102
:TRIGger[:SEQuence]:RFBurst:DELAy?	102
:TRIGger[:SEQuence]:RFBurst:LEVel <rel_power>	102
:TRIGger[:SEQuence]:RFBurst:LEVel?	102
:TRIGger[:SEQuence]:VIDeo:DELAy <time>	103
:TRIGger[:SEQuence]:VIDeo:DELAy?	103
:TRIGger[:SEQuence]:VIDeo:LEVel <ampl>	103

Commands

Alphabetical Listing

:TRIGger[:SEQuence]:VIDeo:LEVel?	103
[:SENSe]:ACP:AVERAge:COUnT <integer>	50
[:SENSe]:ACP:AVERAge:COUnT?	50
[:SENSe]:ACP:AVERAge:TCONtrol EXPonential REPeat	51
[:SENSe]:ACP:AVERAge:TCONtrol?	51
[:SENSe]:ACP:AVERAge[:STATe] OFF ON 0 1	51
[:SENSe]:ACP:AVERAge[:STATe]?	51
[:SENSe]:ACP:FAST OFF ON 0 1	51
[:SENSe]:ACP:FAST?	51
[:SENSe]:ACP:LIMit:TEST OFF ON 0 1	51
[:SENSe]:ACP:LIMit:TEST?	52
[:SENSe]:CFDRift:AVERAge:COUnT <integer>	53
[:SENSe]:CFDRift:AVERAge:COUnT?	53
[:SENSe]:CFDRift:AVERAge:TCONtrol EXPonential REPeat	54
[:SENSe]:CFDRift:AVERAge:TCONtrol?	54
[:SENSe]:CFDRift:AVERAge[:STATe] OFF ON 0 1	53
[:SENSe]:CFDRift:AVERAge[:STATe]?	53
[:SENSe]:CFDRift:BSYNc:SOURce PREAmble NONE	54
[:SENSe]:CFDRift:BSYNc:SOURce?	54
[:SENSe]:CFDRift:FILTer ON OFF 1 0	55
[:SENSe]:CFDRift:FILTer?	55
[:SENSe]:CFDRift:LIMit:TEST OFF ON 0 1	55
[:SENSe]:CFDRift:LIMit:TEST?	55
[:SENSe]:CFDRift:TRIGger:SOURce IMMEDIATE EXTernal RFBurst	56
[:SENSe]:CFDRift:TRIGger:SOURce?	56
[:SENSe]:CFDRift:VOFFset <real number>	56
[:SENSe]:CFDRift:VOFFset?	56
[:SENSe]:CHANnel:FHOPping OFF ON 0 1	57
[:SENSe]:CHANnel:FHOPping?	57
[:SENSe]:CHANnel:SETRiggering On Off 1 0	58
[:SENSe]:CHANnel:SETRiggering?	58

Commands

Alphabetical Listing

[::SENSe]:CHANnel[:NUMBER] <integer>	57
[::SENSe]:CHANnel[:NUMBER]?.	57
[::SENSe]:CORRection:GAIN <dB>	58
[::SENSe]:CORRection:GAIN?	58
[::SENSe]:CORRection:LOSS <dB>	59
[::SENSe]:CORRection:LOSS?	59
[::SENSe]:DEFaults.	59
[::SENSe]:DEViation <freq>.	59
[::SENSe]:DEViation?.	59
[::SENSe]:FREQuency:AUTO	60
[::SENSe]:FREQuency:CENTer <freq>	60
[::SENSe]:FREQuency:CENTer?	60
[::SENSe]:ICFTol:AVERAge:COUNt <integer>.	62
[::SENSe]:ICFTol:AVERAge:COUNt?	62
[::SENSe]:ICFTol:AVERAge:TCONtrol EXPonential REPeat	63
[::SENSe]:ICFTol:AVERAge:TCONtrol?	63
[::SENSe]:ICFTol:AVERAge[:STATe] OFF ON 0 1	62
[::SENSe]:ICFTol:AVERAge[:STATe]?.	62
[::SENSe]:ICFTol:BSYNc:SOURce PREamble NONE	63
[::SENSe]:ICFTol:BSYNc:SOURce?	63
[::SENSe]:ICFTol:FILTer ON OFF 1 0	64
[::SENSe]:ICFTol:FILTer?	64
[::SENSe]:ICFTol:LIMit:TEST OFF ON 0 1	64
[::SENSe]:ICFTol:LIMit:TEST?	64
[::SENSe]:ICFTol:TRIGger:SOURce IMMEDIATE EXTernal RFBurst	65
[::SENSe]:ICFTol:TRIGger:SOURce?	65
[::SENSe]:MCHar:AVERAge:COUNt <integer>	66
[::SENSe]:MCHar:AVERAge:COUNt?.	66
[::SENSe]:MCHar:AVERAge:TCONtrol EXPonential REPeat.	67
[::SENSe]:MCHar:AVERAge:TCONtrol?	67
[::SENSe]:MCHar:AVERAge[:STATe] OFF ON 0 1	66

Commands

Alphabetical Listing

[[:SENSe]:MCHar:AVERage[:STATe]?	66
[[:SENSe]:MCHar:BANDwidth BWIDth[:RESolution]: DFONe DFTWo <freq>	68
[[:SENSe]:MCHar:BANDwidth BWIDth[:RESolution]: DFONe DFTWo?	68
[[:SENSe]:MCHar:BSYNc:SOURce PREamble NONE	69
[[:SENSe]:MCHar:BSYNc:SOURce?	69
[[:SENSe]:MCHar:FILTer ON OFF 1 0	69
[[:SENSe]:MCHar:FILTer?	69
[[:SENSe]:MCHar:HRESult OFF DF1 DF2	70
[[:SENSe]:MCHar:HRESult?	70
[[:SENSe]:MCHar:LIMit:TEST OFF ON 0 1	70
[[:SENSe]:MCHar:LIMit:TEST?	70
[[:SENSe]:MCHar:PDATa AUTO LFPattern HFPattern	71
[[:SENSe]:MCHar:PDATa?	71
[[:SENSe]:MCHar:TRIGger:SOURce IMMEDIATE EXternal RFBurst	71
[[:SENSe]:MCHar:TRIGger:SOURce?	71
[[:SENSe]:MONitor:AVERage:COUNt <integer>	72
[[:SENSe]:MONitor:AVERage:COUNt?	72
[[:SENSe]:MONitor:AVERage:TCONtrol EXPonential REPeat	72
[[:SENSe]:MONitor:AVERage:TCONtrol?	73
[[:SENSe]:MONitor:AVERage[:STATe] OFF ON 0 1	72
[[:SENSe]:MONitor:AVERage[:STATe]?	72
[[:SENSe]:MONitor:BAND:BANDwidth BWIDth:VIDeo <freq>	74
[[:SENSe]:MONitor:BAND:BANDwidth BWIDth:VIDeo?	74
[[:SENSe]:MONitor:BAND:BANDwidth BWIDth[:RESolution] <freq>	74
[[:SENSe]:MONitor:BAND:BANDwidth BWIDth[:RESolution]?	74
[[:SENSe]:MONitor:BAND:DETEctor POSitive SAMPle NEGative	75
[[:SENSe]:MONitor:BAND:DETEctor?	75
[[:SENSe]:MONitor:BAND:MAXHold[:STATe] OFF ON 0 1	75
[[:SENSe]:MONitor:BAND:MAXHold[:STATe]?	75
[[:SENSe]:MONitor:BAND:SPAN <freq>	76

Commands

Alphabetical Listing

[::SENSe]:MONitor:BAND:SPAN?	76
[::SENSe]:MONitor:BAND:SWEEP:TIME <real number>	76
[::SENSe]:MONitor:BAND:SWEEP:TIME:AUTO OFF ON 0 1	77
[::SENSe]:MONitor:BAND:SWEEP:TIME:AUTO?	77
[::SENSe]:MONitor:BAND:SWEEP:TIME?	76
[::SENSe]:MONitor:CHANnel SINGle TRIPle	77
[::SENSe]:MONitor:CHANnel:BANDwidth BWIDth:VIDeo <freq>	78
[::SENSe]:MONitor:CHANnel:BANDwidth BWIDth:VIDeo?	78
[::SENSe]:MONitor:CHANnel:BANDwidth BWIDth[:RESolution] <freq>	78
[::SENSe]:MONitor:CHANnel:BANDwidth BWIDth[:RESolution]?	78
[::SENSe]:MONitor:CHANnel:DETECTOR POSitive SAMPle NEGative	79
[::SENSe]:MONitor:CHANnel:DETECTOR?	79
[::SENSe]:MONitor:CHANnel:MAXHold[:STATe] OFF ON 0 1	79
[::SENSe]:MONitor:CHANnel:MAXHold[:STATe]?	79
[::SENSe]:MONitor:CHANnel:SWEEP:TIME <real number>	80
[::SENSe]:MONitor:CHANnel:SWEEP:TIME:AUTO OFF ON 0 1	80
[::SENSe]:MONitor:CHANnel:SWEEP:TIME:AUTO?	80
[::SENSe]:MONitor:CHANnel:SWEEP:TIME?	80
[::SENSe]:MONitor:CHANnel?	77
[::SENSe]:MONitor:METHod CHANnel BAND	81
[::SENSe]:MONitor:METHod?	81
[::SENSe]:MOVerview:AVERAge:COUNT <integer>	81
[::SENSe]:MOVerview:AVERAge:COUNT?	81
[::SENSe]:MOVerview:AVERAge:TCONtrol EXPonential REPeat	82
[::SENSe]:MOVerview:AVERAge:TCONtrol?	82
[::SENSe]:MOVerview:AVERAge[:STATe] OFF ON 0 1	82
[::SENSe]:MOVerview:AVERAge[:STATe]?	82
[::SENSe]:MOVerview:BSYNc:SOURce PREAmble NONE	83
[::SENSe]:MOVerview:BSYNc:SOURce?	83
[::SENSe]:MOVerview:FILTer ON OFF 1 0	83
[::SENSe]:MOVerview:FILTer?	83

Commands

Alphabetical Listing

[[:SENSe]:MOVerview:TRIGger:SOURce IMMEDIATE EXTernal RFBurst	84
[[:SENSe]:MOVerview:TRIGger:SOURce?	84
[[:SENSe]:MOVerview:VOFFset <real number>	84
[[:SENSe]:MOVerview:VOFFset?	84
[[:SENSe]:OPOWer:AVERage:COUNT <integer>	85
[[:SENSe]:OPOWer:AVERage:COUNT?	85
[[:SENSe]:OPOWer:AVERage:TCONtrol EXPonential REPeat	85
[[:SENSe]:OPOWer:AVERage:TCONtrol?	85
[[:SENSe]:OPOWer:AVERage:TYPE LPOWer POWER	87
[[:SENSe]:OPOWer:AVERage:TYPE?	87
[[:SENSe]:OPOWer:AVERage[:STATe] OFF ON 0 1	85
[[:SENSe]:OPOWer:AVERage[:STATe]?	85
[[:SENSe]:OPOWer:BSYNc:SOURce PREAmble RFAMplitude NONE	87
[[:SENSe]:OPOWer:BSYNc:SOURce?	87
[[:SENSe]:OPOWer:LIMit:TEST OFF ON 0 1	88
[[:SENSe]:OPOWer:LIMit:TEST?	88
[[:SENSe]:OPOWer:STARt <real number>	88
[[:SENSe]:OPOWer:STARt?	88
[[:SENSe]:OPOWer:STOP <real number>	89
[[:SENSe]:OPOWer:STOP?	89
[[:SENSe]:OPOWer:TRIGger:SOURce IMMEDIATE EXTernal RFBurst VIDeo	89
[[:SENSe]:OPOWer:TRIGger:SOURce?	89
[[:SENSe]:OSBWidth:AVERage:COUNT <integer>	90
[[:SENSe]:OSBWidth:AVERage:COUNT?	90
[[:SENSe]:OSBWidth:AVERage:TCONtrol EXPonential REPeat	91
[[:SENSe]:OSBWidth:AVERage:TCONtrol?	91
[[:SENSe]:OSBWidth:AVERage[:STATe] OFF ON 0 1	90
[[:SENSe]:OSBWidth:AVERage[:STATe]?	90
[[:SENSe]:OSBWidth:BAND:SPAN <freq>	92
[[:SENSe]:OSBWidth:BAND:SPAN?	92
[[:SENSe]:OSBWidth:BAND:VIDeo <freq>	92

Commands

Alphabetical Listing

[[:SENSe]:OSBWidth:BAND:VIDeo?	92
[[:SENSe]:OSBWidth:BAND[RESolution] <freq>	91
[[:SENSe]:OSBWidth:BAND[RESolution]?	91
[[:SENSe]:OSBWidth:LIMit:TEST OFF ON 0 1	92
[[:SENSe]:OSBWidth:LIMit:TEST?	92
[[:SENSe]:OSBWidth:MAXHold[:STATe] OFF ON 0 1.	93
[[:SENSe]:OSBWidth:MAXHold[:STATe]?	93
[[:SENSe]:OSBWidth:SWEEP:TIME <real number>	93
[[:SENSe]:OSBWidth:SWEEP:TIME:AUTO OFF ON 0 1	94
[[:SENSe]:OSBWidth:SWEEP:TIME:AUTO?	94
[[:SENSe]:OSBWidth:SWEEP:TIME?	93
[[:SENSe]:OSBWidth:XDB <dB>	94
[[:SENSe]:OSBWidth:XDB?	94
[[:SENSe]:PACKet:ACHeader	95
[[:SENSe]:PACKet:ACHeader?	95
[[:SENSe]:PACKet:DH1 DH3 DH5Crc <bits>	95
[[:SENSe]:PACKet:DH1 DH3 DH5Crc?	95
[[:SENSe]:PACKet:DH1 DH3 DH5Header <bits>	96
[[:SENSe]:PACKet:DH1 DH3 DH5Header?	96
[[:SENSe]:PACKet:DH1 DH3 DH5Length <bits>	96
[[:SENSe]:PACKet:DH1 DH3 DH5Length?	96
[[:SENSe]:POWer[:RF]:ATTenuation <rel_power>	97
[[:SENSe]:POWer[:RF]:ATTenuation?	97
[[:SENSe]:POWer[:RF]:GAIN[:STATe] OFF ON 0 1	98
[[:SENSe]:POWer[:RF]:GAIN[:STATe]?	98
[[:SENSe]:POWer[:RF]:RANGe <dBm>	98
[[:SENSe]:POWer[:RF]:RANGe:AUTO OFF ON 0 1	99
[[:SENSe]:POWer[:RF]:RANGe:AUTO?	99
[[:SENSe]:POWer[:RF]:RANGe?	98
[[:SENSe]:PTYPe DH1 DH3 DH5	97
[[:SENSe]:PTYPe?	97

Commands

Alphabetical Listing

[:SENSe]:RADio:DEVice PC1 PC2 PC3.	99
[:SENSe]:RADio:DEVice?	99
[:SENSe]:SYNC:BURSt:SPRetrig <seconds>	100
[:SENSe]:SYNC:BURSt:SPRetrig?	100
[:SENSe]:SYNC:BURSt:STHReshold <rel_power>	100
[:SENSe]:SYNC:BURSt:STHReshold?	100

1 **Programming Command
Cross-References**

Functional Index to SCPI Subsection

The following table lists the SCPI subsystems or subsections associated with the instrument Bluetooth function categories. The commands listed are for Bluetooth specific functions. These commands are documented in [Chapter 2](#), “[Language Reference](#).” If you require information on the commands for the Agilent ESA Spectrum Analyzers, refer to the *Agilent ESA Spectrum Analyzers Programmer’s Guide*.

Function Category	SCPI Subsection or Subsystem
AMPLITUDE	:CALCulate:CFDrift :CALCulate:ICFTol :CALCulate:MCHar :CALCulate:OPower :CONFigure :FETCh :MEASure :READ
ATTENUATION	[SENSe]:POWer
AVERAGING	[:SENSe]:CFDrift [:SENSe]:ICFTol [:SENSe]:MCHar [:SENSe]:MONitor [:SENSe]:MOVerview [:SENSe]:OPower [:SENSe]:OSBWidth
BAND, BANDWIDTH	[:SENSe]:MCHar [:SENSe]:MONitor [:SENSe]:OSBWidth :CONFigure :FETCh :MEASure :READ
BURST	TRIGger [:SENSe]:CFDrift [:SENSe]:ICFTol [:SENSe]:MCHar [:SENSe]:MOVerview [:SENSe]:OPower [:SENSe]:SYNC
Corrections	[:SENSe]:CORRection
DETECTOR	[:SENSe]:MONitor

Function Category	SCPI Subsection or Subsystem
DISPLAY	[[:SENSe]:CFDRift [:SENSe]:MONitor [:SENSe]:MOVerview
FREQUENCY	:CALCulate:CFDRift :CALCulate:ICFTol :CALCulate:MCHar [:SENSe]:CFDRift [:SENSe]:CHANnel [:SENSe]:CHANnel:FHOPping [:SENSe]:DEViation [:SENSe]:FREQuency [:SENSe]:ICFTol :CONFigure :FETCh :MEASure :READ
FREQUENCY SPAN	:CONFigure :FETCh :MEASure :READ
LIMITS	:CALCulate:ACP :CALCulate:CFDrift :CALCulate:ICFTol :CALCulate:MCHar :CALCulate:OPower [:SENSe]:ACP [:SENSe]:CFDRift [:SENSe]:ICFTol [:SENSe]:MCHar [:SENSe]:OPower [:SENSe]:OSBWidth
MARKER	[[:SENSe]:OPower
MEASURE	:CONFigure :FETCh :MEASure :READ [:SENSe]:MONitor

Programming Command Cross-References
Functional Index to SCPI Subsection

Function Category	SCPI Subsection or Subsystem
TRIGGER	TRIGger [:SENSe]:CFDRift [:SENSe]:ICFTol [:SENSe]:MCHar [:SENSe]:MOVerview [:SENSe]:OPOWER :CONFigure :FETCh :MEASure :READ

2 **Language Reference**

These commands are only available when the Bluetooth mode has been selected using INSTRUMENT:SElect or INSTRUMENT:NSElect. If the Bluetooth mode is selected, commands that are unique to another mode are not available.

ABORt Subsystem

Abort Command

:ABORt

Stops any sweep or measurement in progress and resets the sweep or trigger system. A measurement refers to any of the measurements found in the **MEASURE** menu.

If **INITiate:CONTinuous** is off (single measure), then **:INITiate:IMMediate** will start a new single measurement.

If **:INITiate:CONTinuous** is on (continuous measure), a new continuous measurement begins immediately.

The **INITiate** and/or **TRIGger** subsystems contain additional related commands.

Front Panel

Access: For the continuous measurement mode, the **Restart** key is equivalent to **ABORt**.

CALCulate Subsystem

This subsystem is used to perform post-acquisition data processing. In effect, the collection of new data triggers the CALCulate subsystem. In this instrument, the primary functions in this subsystem are markers and limits.

ACP - Limits

Adjacent Channel Power—Far Limit Test

:CALCulate:ACP:LIMit:FAR:UPPer[:DATA] <real number>

:CALCulate:ACP:LIMit:FAR:UPPer[:DATA]?

Set the far limit, in dBm for adjacent channel power testing. The sum of the peak power of the adjacent channel power measurement results are tested against this value.

Factory Preset

and *RST: –40 dBm

Range: –90 to 0 dBm

Default Unit: dBm

Remarks: You must be in Bluetooth mode to use this command. Use INSTRument:SElect to set the mode.

Front Panel

Access: **Meas Setup, More, Limits**

Adjacent Channel Power—Near Limit Test

:CALCulate:ACP:LIMit:NEAR:UPPer[:DATA] <real number>

:CALCulate:ACP:LIMit:NEAR:UPPer[:DATA]?

Set the near limit, in dBm for adjacent channel power testing. The sum of the peak power of the adjacent channel power measurement results are tested against this value.

Factory Preset

and *RST: –20 dBm

Range: –90 to 0 dBm

Default Unit: dBm

Remarks: You must be in Bluetooth mode to use this command. Use INSTRument:SElect to set the mode.

Front Panel

Access: **Meas Setup, More, Limits**

Carrier Frequency Drift Limit Commands

Carrier Frequency Drift—Upper Limit

`:CALCulate:CFDRift:LIMit:DH1|DH3|DH5[:UPPer][[:DATA]<freq>`

`:CALCulate:CFDRift:LIMit:DH1|DH3|DH5[:UPPer][[:DATA]?`

Set the upper frequency limit for carrier frequency drift. This limit is set depending on the selected Packet Type.

Factory Preset

and *RST:	DH1 Packet	25 kHz
	DH3 Packet	40 kHz
	DH5 Packet	40 kHz

Range: -500 kHz to 500 kHz

Remarks: If the Freq Drift is greater than this limit, the measurement display will append a red “F” to the value.

You must be in the Bluetooth mode to use this command. Use INSTRument:SElect to set the mode.

Front Panel

Access: **Meas Setup, Limits...**

Carrier Frequency Drift—Lower Limit

`:CALCulate:CFDRift:LIMit:DH1|DH3|DH5:LOWer[:DATA]<freq>`

`:CALCulate:CFDRift:LIMit:DH1|DH3|DH5:LOWer[:DATA]?`

Set the lower frequency limit for carrier frequency drift. This limit is set depending on the selected Packet Type.

Factory Preset

and *RST:	DH1 Packet	-25 kHz
	DH3 Packet	-40 kHz
	DH5 Packet	-40 kHz

Range: -500 kHz to 500 kHz

Remarks: If the Freq Drift is less than this limit, the measurement display will append a red “F” to the value.

You must be in the Bluetooth mode to use this command. Use INSTRument:SElect to set the mode.

Front Panel

Access: **Meas Setup, Limits...**

Carrier Frequency Drift—Maximum Drift Rate Upper Limit

```
:CALCulate:CFDRift:LIMit:MDRate[:UPPer][:DATA]<freq>  
:CALCulate:CFDRift:LIMit:MDRate[:UPPer][:DATA]?
```

Set the maximum drift rate upper limit.

Factory Preset

and *RST: 20 kHz

Range: -500 kHz to 500 kHz

Remarks: If the Max Drift Rate is greater than this limit, the measurement display will append a red “F” to the value.

You must be in the Bluetooth mode to use this command. Use INSTRument:SElect to set the mode.

Front Panel

Access: **Meas Setup, Limits...**

Carrier Frequency Drift—Maximum Drift Rate Lower Limit

```
:CALCulate:CFDRift:LIMit:MDRate:LOWer[:DATA]<freq>  
:CALCulate:CFDRift:LIMit:MDRate:LOWer[:DATA]?
```

Set the maximum drift rate lower limit.

Factory Preset

and *RST: -20 kHz

Range: -500 kHz to 500 kHz

Remarks: If the Max Drift Rate is less than this limit, the measurement display will append a red “F” to the value.

You must be in the Bluetooth mode to use this command. Use INSTRument:SElect to set the mode.

Front Panel

Access: **Meas Setup, Limits...**

Test Current Results Against all Limits

```
:CALCulate:CLIMits:FAIL?
```

Queries the status of the current measurement limit testing. It returns a 0 if the measured results pass when compared with the current limits. It returns a 1 if the measured results fail any limit tests.

Initial Carrier Frequency Tolerance (ICFT) Limit Commands

ICFT—Upper Limit

:CALCulate:ICFTol:LIMit[:UPPer][:DATA]<freq>

:CALCulate:ICFTol:LIMit[:UPPer][:DATA]?

Set the upper frequency limit for ICFT.

Factory Preset

and *RST: 75 kHz

Range: 0 Hz to 500 kHz

Remarks: You must be in the Bluetooth mode to use this command. Use INSTRument:SElect to set the mode.

Front Panel

Access: **Meas Setup, Limits**

ICFT—Lower Limit

:CALCulate:ICFTol:LIMit:LOWer[:DATA]<freq>

:CALCulate:ICFTol:LIMit:LOWer[:DATA]?

Set the lower frequency limit for ICFT.

Factory Preset

and *RST: -75 kHz

Range: -500 kHz to 0 Hz

Remarks: You must be in the Bluetooth mode to use this command. Use INSTRument:SElect to set the mode.

Front Panel

Access: **Meas Setup, Limits**

Modulation Characteristics Limit Commands

Modulation Characteristics—Average Lower Limit

:CALCulate:MCHar:LIMit:DF1avg:LOWer[:DATA]<freq>

:CALCulate:MCHar:LIMit:DF1avg:LOWer[:DATA]?

Set the lower frequency limit for $\Delta f_{1\text{avg}}$.

Factory Preset

and *RST: Δf_1 140 kHz

Range: 0 to 500 kHz

Remarks: You must be in the Bluetooth mode to use this command. Use INSTRument:SElect to set the mode.

Front Panel

Access: **Meas Setup, Limits**

Modulation Characteristics—Average Upper Limit

:CALCulate:MCHar:LIMit:DF1avg[:UPPer][:DATA]<freq>

:CALCulate:MCHar:LIMit:DF1avg[:UPPer][:DATA]?

Set the upper frequency limit for $\Delta f_{1\text{avg}}$.

Factory Preset

and *RST: Δf_1 175 kHz

Range: 0 to 500 kHz

Remarks: You must be in the Bluetooth mode to use this command. Use INSTRument:SElect to set the mode.

Front Panel

Access: **Meas Setup, Limits**

Modulation Characteristics—Ratio Lower Limit

:CALCulate:MCHar:LIMit:RATio:LOWer[:DATA]<real number, %>

:CALCulate:MCHar:LIMit:RATio:LOWer[:DATA]?

Set the lower limit of the deviation ratio. This is the ratio of Δf_2 avg to Δf_1 avg expressed as a percentage.

Factory Preset

and *RST: 80.000%

Range: 0 to 100%

Remarks: You must be in the Bluetooth mode to use this command. Use INSTRument:SElect to set the mode.

Front Panel

Access: **Meas Setup, Limits**

Output Power Limit Commands

Output Power—Average Power Upper Limit

```
:CALCulate:OPower:LIMit:PC1|PC2|PC3:AVERage  
[:UPPer][:DATA]<dBm>
```

```
:CALCulate:OPower:LIMit:PC1|PC2|PC3:AVERage[:UPPer][:DATA]?
```

Set the average power upper limit. The limit is set depending on the selected Power Class.

Factory Preset

and *RST:	Power Class 1	20.00 dBm
	Power Class 2	4.00 dBm
	Power Class 3	0.00 dBm

Range: -100.00 to 30.00 dBm

Remarks: If the average power is greater than this limit, the measurement display will append a red “F” to the value.

You must be in the Bluetooth mode to use this command. Use INSTRument:SElect to set the mode.

Front Panel

Access: **Meas Setup, Limits...**

Output Power—Average Power Lower Limit

:CALCulate:OPower:LIMit:PC1|PC2|PC3:AVERage:LOWer[:DATA]<dBm>

:CALCulate:OPower:LIMit:PC1|PC2|PC3:AVERage:LOWer[:DATA]?

Set the average power lower limit. The limit is set depending on the selected Power Class.

Factory Preset
 and *RST:

Power Class 1	0.00 dBm
Power Class 2	-6.00 dBm
Power Class 3	N/A

Range: -100.00 to 30.00 dBm

Remarks: If the average power is less than this limit, the measurement display will append a red “F” to the value. If Power Class 3 is selected, this parameter is not required.

You must be in the Bluetooth mode to use this command. Use INSTRument:SElect to set the mode.

Front Panel

Access: **Meas Setup, Limits...**

Output Power—Peak Power Upper Limit

:CALCulate:OPower:LIMit:PEAK[:UPPer][:DATA]<dBm>

:CALCulate:OPower:LIMit:PEAK[:UPPer][:DATA]?

Set the peak power upper limit. The limit is set depending on the selected Power Class.

Factory Preset
 and *RST:

23.00 dBm

Range: -100.00 to 30.00 dBm

Remarks: If the peak power is greater than this limit, the measurement display will append a red “F” to the value.

You must be in the Bluetooth mode to use this command. Use INSTRument:SElect to set the mode.

Front Panel

Access: **Meas Setup, Limits...**

Output Spectrum Bandwidth Limit Commands

Output Spectrum Bandwidth—Upper Limit

`:CALCulate:OSBWidth:LIMit[:UPPer][:DATA]<freq>`

`:CALCulate:OSBWidth:LIMit[:UPPer][:DATA]?`

Set the upper bandwidth limit for output spectrum bandwidth.

Factory Preset

and *RST: 1 MHz

Range: -5 MHz to 5 MHz

Default Unit: Hz

Remarks: You must be in the Bluetooth mode to use this command. Use INSTRument:SElect to set the mode.

Front Panel

Access: **Meas Setup, Limits**

CONFigure Subsystem

CONFigure subsystem commands apply only to measurements found in the MEASURE menu. These commands stop the current measurement and set up the instrument for the specified measurement using the factory default instrument settings.

:CONFigure:<measurement> will always set :INITiate:CONTinuous OFF (single mode), and also places the measurement in the idle state.

:CONFigure:SANalyzer causes the present measurement to exit (functionally the same as pressing MODE, SA), and places the analyzer in base instrument spectrum analyzer state.

The query :CONFigure? returns the current measurement name in quotes.

Each measurement sets the instrument state that is appropriate for that measurement. Other commands are available for each **Mode** to allow changing settings, view, limits, etc. Refer to:

SENSe:<measurement>, SENSe:CHANnel, SENSe:CORRection,
 SENSe:DEFaults, SENSe:DEViation, SENSe:FREQUency, SENSe:PACKet,
 SENSe:POWer, SENSe:RADio, SENSe:SYNC,
 CALCulate:<measurement>, CALCulate:CLIMits,
 TRIGger

FETCh Subsystem

FETCh subsystem commands apply only to measurements found in the MEASURE menu. FETCh commands can only be used as queries.

FETCh commands put valid data into the output buffer, but do not initiate data acquisition. Use the :INITiate[:IMMediate] command to acquire data. You can only fetch results from the measurement that is selected, and when current measurement results are valid.

:FETCh <meas>? will return valid data only when the measurement is in one of the following states:

- idle
- initiated
- paused

INITiate Subsystem

The INITiate subsystem is used to control the initiation of the trigger. Refer to the TRIGger and ABORt subsystems for related commands.

Continuous or Single Measurements

:INITiate:CONTinuous OFF|ON|0|1

:INITiate:CONTinuous?

Factory Preset: On

*RST:

Front Panel

Access: **Sweep, Sweep Cont Single** (SA mode)

Single

Meas Control, Measure Cont Single

Take New Data Acquisitions

:INITiate[:IMMediate]

This command is used to place the measurement in an awaiting trigger state. When a valid trigger is received, the measurement will begin. If the measurement is currently running, this will cause a restart. A “measurement” refers to any function under the MEASURE key.

Remarks: See also the *TRG command and the TRIGger subsystem.

Use the [:SENSe]:<meas>:TRIGger:SOURce command to select the desired trigger.

Use :FETCh? to transfer a measurement result from memory to the output buffer. Refer to individual commands in the FETCh subsystem for more information.

Front Panel

Access: **Sweep, Sweep Cont Single** (SA mode)

Single

Meas Control, Measure Cont Single

Pause the Measurement

:INITiate:PAUSE

Pauses the current measurement by changing the current measurement state from the “wait for trigger” state to the “paused” state. If the measurement is not in the “wait for trigger” state, when the command is issued, the transition will be made the next time that state is entered as part of the trigger cycle. When in the paused state, the spectrum analyzer auto-align process stops. If the analyzer is paused for a long period of time, measurement accuracy may degrade.

Front Panel

Access: **Meas Control, Pause**

Restart the Measurement

:INITiate:REStart

This command applies to measurements found in the MEASURE menu.

It restarts the current measurement from the “idle” state regardless of its current operating state. It is equivalent to:

INITiate[:IMMediate]

ABORt (for continuous measurement mode)

Front Panel

Access: **Restart**

or

Meas Control, Restart

Resume the Measurement

:INITiate:RESume

Resumes the current measurement by changing the current measurement state from the “paused state” back to the “wait for trigger” state. If the measurement is not in the “paused” state, when the command is issued, an error is reported. Only include if INIT:IMM is implemented as an overlapping command. Note: INITiate:PAUSE was TEST:RESume.

Front Panel

Access: **Meas Control, Resume**

INSTRUMENT Subsystem

This subsystem includes commands for querying and selecting instrument measurement (personality option) modes.

Select Application by Number

:INSTRUMENT:NSELECT <integer>

:INSTRUMENT:NSELECT?

Select the measurement application by its instrument number. The actual available choices depends upon which applications are installed in the instrument.

1 = SA

228 = BLUETOOTH

NOTE

If you are using the SCPI status registers and the analyzer mode is changed, the status bits should be read, and any errors resolved, prior to switching modes. Error conditions that exist prior to switching modes cannot be detected using the condition registers after the mode change. This is true unless they recur after the mode change, although transitions of these conditions can be detected using the event registers.

Changing modes resets all SCPI status registers and mask registers to their power-on defaults. Hence, any event or condition register masks must be re-established after a mode change. Also note that the power up status bit is set by any mode change, since that is the default state after power up.

Factory Preset

and *RST: Persistent state with factory default of 1

Range: 1 to x, where x depends upon which applications are installed.

Front Panel

Access: **Mode**

Select Application

```
:INSTRument[:SElect]  
  'SA' | 'GSM' | 'CDMA' | 'PNOISE' | 'BLUETOOTH'  
  
:INSTRument[:SElect]?
```

Select the measurement application mode. The actual available choices depend upon which applications (modes) are installed in the instrument. See the manual for your installed options for the mode designator.

Once the instrument mode is selected, only the commands that are valid for that mode can be executed.

NOTE

If you are using the status bits and the analyzer mode is changed, the status bits should be read, and any errors resolved, prior to switching modes. Error conditions that exist prior to switching modes cannot be detected using the condition registers after the mode change. This is true unless they recur after the mode change, although transitions of these conditions can be detected using the event registers.

Changing modes resets all SCPI status registers and mask registers to their power-on defaults. Hence, any event or condition register masks must be re-established after a mode change. Also note that the power up status bit is set by any mode change, since that is the default state after power up.

Factory Preset
and *RST: Persistent state with factory default of Spectrum Analyzer

Front Panel
Access: **Mode**

MEASure Group of Commands

This group includes the CONFigure, FETCH, MEASure, and READ commands that are used to make measurements and return results. The different commands can be used to provide fine control of the overall measurement process, like altering measurement parameters from their default settings. Most measurements should be done in single measurement mode, rather than doing the measurement continuously.

Measure Commands

:MEASure:<measurement>[n]?

This is a fast single-command way to make a measurement using the factory default instrument settings. These are the settings and units that conform to the Radio Standard that is currently selected.

- Stops the current measurement and sets up the instrument for the specified measurement using the factory defaults
- Initiates the data acquisition for the measurement
- Blocks other SCPI communication, waiting until the measurement is complete before returning results.
- Turns the averaging function on and sets the number of averages to 10 for all measurements.
- After the data is valid it returns the scalar results, or the trace data, for the specified measurement.

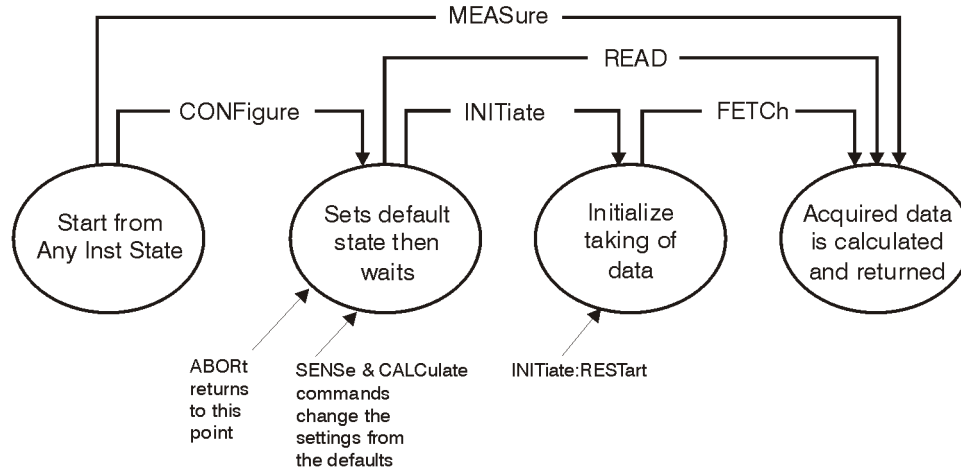
If the optional [n] value is not included, or is set to 1, the scalar measurement results will be returned. If the [n] value is set to a value other than 1, the selected trace data results will be returned. See each command for details of what types of scalar results or trace data results are available.

If you need to change some of the measurement parameters from the factory default settings you can set up the measurement with the CONFigure command. Use the commands in the SENSE:<measurement> and CALCulate:<measurement> subsystems to change the settings. Then you can use the READ? command, or the INITiate and FETCh? commands, to initiate the measurement and query the results. See [Figure 2-1](#).

If you need to repeatedly make a given measurement with settings other than the factory defaults, you can use the commands in the SENSE:<measurement> and CALCulate:<measurement> subsystems to set up the measurement. Then use the READ? command or INITiate and FETCh? commands, to initiate the measurement and query results.

Measurement settings persist if you initiate a different measurement and then return to a previous one. Use `READ:<measurement>?` if you want to use those persistent settings. If you want to go back to the default settings, use `MEASure:<measurement>?`.

Figure 2-1 Measurement Group of Commands



ca81a

Configure Commands

:CONFigure:<measurement>

This command stops the current measurement and sets up the instrument for the specified measurement using the factory default instrument settings. It does not initiate the taking of measurement data. This command also turns the averaging function on and sets the number of averages to 10 for all measurements.

The `CONFigure?` query returns the current measurement name.

Fetch Commands

:FETCh:<measurement>[n]?

This command puts selected data from the most recent measurement into the output buffer (data acquisition is not initiated, however). Use the `INITiate[:IMMEDIATE]` command to acquire data before you use the `FETCh` command. You can only fetch results from the measurement that is currently selected.

If the optional `[n]` value is not included, or is set to 1, the scalar measurement results will be returned. If the `[n]` value is set to a value other than 1, the selected trace data results will be returned. See each command for details of what types of scalar results or trace data results are available.

`FETCh` may be used to return results other than those specified with the `READ` or `MEASure` commands.

Read Commands

:READ:<measurement>[n]?

- Does not preset the measurement to the factory defaults. (The MEASure? and CONFigure? commands reset the parameters to the default values.) READ uses the settings from the last measurement.
- Initiates the measurement which puts new data into the output buffer. If a measurement other than the current one is specified, the instrument will switch to that measurement before it initiates the measurement and returns results.
- Blocks other SCPI communication, waiting until the measurement is complete before returning the results.

If the optional [n] value is not included, or is set to 1, the scalar measurement results will be returned. If the [n] value is set to a value other than 1, the selected trace data results will be returned. See each command for details of what types of scalar results or trace data results are available.

Measurement settings persist if you initiate a different measurement and then return to a previous one. Use READ:<measurement>? if you want to use those persistent settings. If you want to go back to the default settings, use MEASure:<measurement>?.

Adjacent Channel Power (ACP) Measurement

This measures and sums the maximum power in all the channels EXCEPT the Transmit Channel and the immediately adjacent. You must be in Bluetooth mode to use these commands. Use INSTRument:SELEct to set the mode.

The general functionality of CONFIgure, FETCh, MEASure, and READ are described at the beginning of this section. See the SENSE:ACP commands for more measurement related commands.

:CONFIgure:ACP

:FETCh:ACP[n]?

:READ:ACP[n]?

:MEASure:ACP[n]?

Front Panel

Access: **Measure, ACP**

After the measurement is selected, press **Restore Meas Defaults** to restore factory defaults.

Measurement Results Available

n	Results Returned
not specified or n=1	Returns 79 scalar values (comma separated) of the PTX per channel. The transmit channel and adjacent channels will contain NaN.

Carrier Frequency Drift Measurement

This measures the performance of the modulator circuitry and the stability of the Voltage Controlled Oscillator (VCO). You must be in the Bluetooth mode to use these commands. Use INSTRument:SElect to set the mode.

The general functionality of CONFigure, FETCh, MEASure, and READ are described at the beginning of this section. See the SENSE:CFDRift commands for more measurement related commands.

:CONFigure:CFDRift
:FETCh:CFDRift[n]?
:READ:CFDRift[n]?
:MEASure:CFDRift[n]?

Front Panel

Access: **Measure, Carrier Freq Drift**

After the measurement is selected, press **Restore Meas Defaults** to restore factory defaults.

Measurement Results Available

n	Results Returned
not specified or n=1	Returns 3 scalar values (comma separated): 1. ICFT 2. Frequency Drift 3. Maximum Drift Rate
2	Returns an N-point trace representing FM deviation samples (specified in kHz) 100 ns apart. The number of trace points returned can be accessed using FETCh:CFDR4?
3	Returns the trace point (from FETCh:CFDR2?) which most closely corresponds to bit p0 (if Burst Sync set to 'None', 0 will always be returned)
4	Returns the number of points that will be returned from FETCh:CFDR2?

Initial Carrier Frequency Tolerance Measurement

This measures the accuracy of the transmitter's center frequency. You must be in the Bluetooth mode to use these commands. Use INSTRUMENT:SELEct to set the mode.

The general functionality of CONFigure, FETCh, MEASure, and READ are described at the beginning of this section. See the SENSE:ICFTol commands for more measurement related commands.

:CONFigure:ICFTol

:FETCh:ICFTol[n]?

:READ:ICFTol[n]?

:MEASure:ICFTol[n]?

Front Panel

Access: **Measure, Init Carrier Freq Tol**

After the measurement is selected, press **Restore Meas Defaults** to restore factory defaults.

Measurement Results Available

n	Results Returned
not specified or n=1	Returns 1 scalar value: Initial carrier frequency tolerance specified in Hz
2	Returns an N-point trace representing FM deviation samples (specified in kHz) 25 ns apart if option B7D installed, 50 ns apart with option AXX, or 100 ns apart if the 1.3 MHz post-detection filter is switched on. The number of trace points returned can be accessed using FETCh:ICFT4?
3	Returns the trace point (from FETCh:ICFT2?) which most closely corresponds to bit p0 (if Burst Sync set to 'None', 0 will always be returned)
4	Returns the number of points that will be returned from FETCh:ICFT2?

Modulation Characteristics Measurement

This measures the modulator performance and the accuracy of the pre-modulation 0.5BT Gaussian filter. You must be in the Bluetooth mode to use these commands. Use INSTRument:SELEct to set the mode.

The general functionality of CONFigure, FETCh, MEASure, and READ are described at the beginning of this section. See the SENSE:MCHar commands for more measurement related commands.

- :CONFigure:MCHar**
- :FETCh:MCHar[n]?**
- :READ:MCHar[n]?**
- :MEASure:MCHar[n]?**

Front Panel

Access: **Measure, Modulation Chars**

After the measurement is selected, press **Restore Meas Defaults** to restore factory defaults.

Measurement Results Available

n	Results Returned
not specified or n=1	Returns 7 scalar values (comma separated): <ol style="list-style-type: none"> 1. Δf_{1avg} 2. Min Δf_{1max} 3. Max Δf_{1max} 4. Δf_{2avg} 5. Min Δf_{2max} 6. Max Δf_{2max} 7. $\Delta f_{2avg}/\Delta f_{1avg}$
2	Returns an N-point trace representing FM deviation samples for the full packet (specified in kHz) 100 ns apart. The number of trace points returned can be accessed using FETCh:MCH4?
3	Returns the trace point (from FETCh:MCH2?) which most closely corresponds to bit p0 (if Burst Sync set to 'None', 0 will always be returned)
4	Returns the number of points that will be returned from FETCh:MCH2?

Monitor Band/Channel Measurement

This measurement has two measurement methods: monitor band and monitor channel. In monitor band, the frequency band is viewed. In monitor channel, the spectrum of a selected channel is viewed.

The general functionality of CONFigure, FETCh, MEASure, and READ are described at the beginning of this section. See the SENSE:MONitor commands for more measurement related commands.

:CONFigure:MONitor

:FETCh:MONitor[n]?

:READ:MONitor[n]?

:MEASure:MONitor[n]?

Front Panel

Access: **Measure, Monitor Band/Channel**

After the measurement is selected, press **Restore Meas Defaults** to restore factory defaults.

Measurement Results Available

n	Results Returned
not specified or n=1	No return value
2	Returns the RF Envelope Trace (data array). This trace contains 401 data points in dBm.
3	Returns the Max Hold Trace (data array). This trace contains 401 data points in dBm.

Modulation Overview Measurement

This measures and reports several modulation metrics on a burst of any type.

The general functionality of CONFigure, FETCh, MEASure, and READ are described at the beginning of this section. See the SENSE:MOVerview commands for more measurement related commands.

:CONFigure:MOVerview

:FETCh:MOVerview[n]?

:READ:MOVerview[n]?

:MEASure:MOVerview[n]?

Front Panel

Access: **Measure, Modulation Overview**

After the measurement is selected, press **Restore Meas Defaults** to restore factory defaults.

Measurement Results Available

n	Results Returned
not specified or n=1	Returns 7 scalar values (comma separated): 1. Payload Bits 2. ICFT 3. Hi/Low Ratio 4. Low -Dev 5. Low +Dev 6. High -Dev 7. High +Dev
2	Returns an N-point trace representing FM deviation samples for the full packet (specified in kHz) 100 ns apart. The number of trace points returned can be accessed using FETCh:MOV4?
3	Returns the trace point (from FETCh:MOV2?) which most closely corresponds to bit p0 (if Burst Sync set to 'None', 0 will always be returned)
4	Returns the number of points that will be returned from FETCh:MOV2?

Output Power Measurement

This measures the output power of a specified channel or center frequency. You must be in the Bluetooth mode to use these commands. Use INSTRument:SElect to set the mode.

The general functionality of CONFigure, FETCh, MEASure, and READ are described at the beginning of this section. See the SENSE:OPOWER commands for more measurement related commands.

:CONFigure:OPOWER

:FETCh:OPOWER[n]?

:READ:OPOWER[n]?

:MEASure:OPOWER[n]?

Front Panel

Access: **Measure, Output Power**

After the measurement is selected, press **Restore Meas Defaults** to restore factory defaults.

Measurement Results Available

n	Results Returned
not specified or n=1	Returns 2 scalar values (comma separated): Average Power Peak Power
2	Returns the RF Envelope Trace Data (data array). This trace contains 401 data points in dBm.

Output Spectrum Bandwidth Measurement

Verify if the emissions inside the operating frequency are within limits. You must be in the Bluetooth mode to use these commands. Use INSTRument:SElect to set the mode.

The general functionality of CONFigure, FETCh, MEASure, and READ are described at the beginning of this section. See the SENSE:OSBWidth commands for more measurement related commands.

```
:CONFigure:OSBWidth  

:FETCh:OSBWidth[n]?  

:READ:OSBWidth[n]?  

:MEASure:OSBWidth[n]?
```

Front Panel

Access: **Measure, Output Spectrum BW**

After the measurement is selected, press **Restore Meas Defaults** to restore factory defaults.

Measurement Results Available

n	Results Returned
not specified or n=1	Returns Output Spectrum –20 dB Bandwidth result
2	Returns the RF Envelope Trace Data (data array). This trace contains 401 data points in mdBm.

MMEMory Subsystem

The purpose of the MMEMory subsystem is to provide access to mass storage devices such as internal or external disk drives. Any part of memory that is treated as a device will be in the MMEMory subsystem.

The purpose of the MMEMory subsystem is to provide access to mass storage devices such as internal or external disk drives.

NOTE

Refer also to :CALCulate and :TRACe subsystems for more trace and limit line commands.

Agilent ESA analyzers use two types of mass storage devices:

- 3.5 inch disk drive (high density, 1.44 MBytes formatted) designated “A:”
- Part of flash memory and treated as a device designated “C:”

The MMEMory command syntax term <file_name> is a specifier having the form: drive:name.ext, where the following rules apply:

- “drive” is “A:” or “C:”
- “name” is a DOS file name of up to eight characters, letters (A-Z, a-z) and numbers (0-9) only (lower case letters are read as uppercase)
- “ext” is an optional file extension using the same rules as “name,” but consists of up to three characters total. (The default file extension will be added if it is not specified.)

Store a Measurement Results in a File

:MMEMory:STORe:RESults filename.csv

Saves the measurement results to a file in memory. The file name must have a file extension of .csv and will be in the CSV (comma-separated values) format.

Example: MMEM:STOR:RES ‘C:mymeas.csv’

Front Panel

Access: **File, Save, Type, Measurement Results**

READ Subsystem

The READ? commands are used with several other commands and are documented in the section on the [“MEASure Group of Commands”](#) on page 37.

SENSE Subsystem

Sets the instrument state parameters so that you can measure the input signal.

SENSE subsystem commands used for measurements in the MEASURE and Meas Setup menus may only be used to set parameters of a specific measurement when the measurement is active. Otherwise, an error will occur. You must first select the appropriate measurement using the :CONFigure:<measurement> command. If a :SENSE command is used to change a parameter during a measurement (while not in its idle state), the measurement will be restarted.

Adjacent Channel Power (ACP) Measurement

Commands for querying the ACP measurement results and for setting to the default values are found in the MEASure group of commands. The equivalent front panel keys for the parameters described in the following commands, are found under the **Meas Setup** key, after the **ACP** measurement has been selected from the **MEASURE** key menu.

Adjacent Channel Power—Average Count

[:SENSE] :ACP :AVERAge :COUNT <integer>

[:SENSE] :ACP :AVERAge :COUNT?

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

Factory Preset

and *RST: 10

Range: 1 to 1000

Remarks: You must be in the Bluetooth mode to use this command. Use INSTRument:SElect to set the mode.

Front Panel

Access: **Meas Setup**

Adjacent Channel Power—Averaging State

[:SENSe] :ACP:AVERAge [:STATe] OFF | ON | 0 | 1

[:SENSe] :ACP:AVERAge [:STATe] ?

Turn the averaging function On or Off.

Factory Preset: On

Remarks: Use INSTRument:SElect to set the mode.

This command is used for measurements in the MEASURE menu.

Front Panel

Access: **Meas Setup**

Adjacent Channel Power—Averaging Termination Control

[:SENSe] :ACP:AVERAge:TCONtrol EXPOnential | REPEat

[:SENSe] :ACP:AVERAge:TCONtrol ?

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

Factory Preset
and *RST: Repeat

Remarks: You must be in the Bluetooth mode to use this command. Use INSTRument:SElect to set the mode.

Front Panel

Access: **Meas Setup**

Adjacent Channel Power—Fast Measurement Mode

[:SENSe] :ACP:FAST OFF | ON | 0 | 1

[:SENSe] :ACP:FAST ?

Turn Fast ACP measurements on and off.

Factory Preset
and *RST: OFF

Remarks: You must be in the Bluetooth mode to use this command. Use INSTRument:SElect to set the mode.

Front Panel

Access: **Meas Setup**

Adjacent Channel Power—Limit Test

[:SENSe] :ACP:LIMIt:TEST OFF | ON | 0 | 1

Language Reference
SENSe Subsystem

[:SENSe] :ACP:LIMit:TEST?

Turn limit checking on and off.

Factory Preset
and *RST: ON

Remarks: You must be in the Bluetooth mode to use this command. Use
INSTrument:SElect to set the mode.

Front Panel
Access: **Meas Setup**

Carrier Frequency Drift Measurement

Commands for querying the carrier frequency drift measurement results and for setting to the default values are found in the MEASure group of commands. The equivalent front panel keys for the parameters described in the following commands, are found under the **Meas Setup** key, after the **Carrier Freq Drift** measurement has been selected from the **MEASURE** key menu.

Carrier Frequency Drift—Average Count

[:SENSe]:CFDRift:AVERAge:COUNT <integer>

[:SENSe]:CFDRift:AVERAge:COUNT?

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

Factory Preset

and *RST: 10

Range: 1 to 1000

Remarks: You must be in the Bluetooth mode to use this command. Use INSTRument:SElect to set the mode.

Front Panel

Access: **Meas Setup, Avg Number**

Carrier Frequency Drift—Averaging State

[:SENSe]:CFDRift:AVERAge[:STATe] OFF | ON | 0 | 1

[:SENSe]:CFDRift:AVERAge[:STATe]?

Turn averaging on or off.

Factory Preset

and *RST: ON

Remarks: You must be in the Bluetooth mode to use this command. Use INSTRument:SElect to set the mode.

Front Panel

Access: **Meas Setup, Avg Number**

Carrier Frequency Drift—Averaging Termination Control

```
[ :SENSE]:CFDRift:AVERage:TCONtrol EXPonential|REPeat
```

```
[ :SENSE]:CFDRift:AVERage:TCONtrol?
```

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

EXPonential - Each successive data acquisition after the average count is reached, is exponentially weighted and combined with the existing average.

REPeat - After reaching the average count, the averaging is reset and a new average is started.

Factory Preset

and *RST: EXPonential

Remarks: You must be in the Bluetooth mode to use this command. Use INSTRUMENT:SElect to set the mode.

Front Panel

Access: **Meas Setup, Avg Mode**

Carrier Frequency Drift—Burst Sync Source

```
[ :SENSE]:CFDRift:BSYNc:SOURce PREamble|NONE
```

```
[ :SENSE]:CFDRift:BSYNc:SOURce?
```

Selects how the measurement will synchronize with the correct part of the burst.

PREamble - uses p0 to define the start of the burst and defines the duration as the packet length of the currently selected packet type.

Factory Preset

and *RST: PREamble

Remarks: You must be in the Bluetooth mode to use this command. Use INSTRUMENT:SElect to set the mode.

Front Panel

Access: **Meas Setup, Burst Sync**

Carrier Frequency Drift—1.3 MHz Post-Detection Filter

`[:SENSe]:CFDRift:FILTer ON|OFF|1|0`

`[:SENSe]:CFDRift:FILTer?`

Turn the 1.3 MHz post-detection filter on and off.

Factory Preset: ON

Remarks: You must be in the Bluetooth mode to use this command. Use INSTRUMENT:SELEct to set the mode.

Option B7D (DSP with Fast ADC) must be installed for this command to be used. The filter is switched Off if Option B7D is not installed.

Front Panel

Access: **Meas Setup, 1.3MHz Filter**

Carrier Frequency Drift—Limit Test

`[:SENSe]:CFDRift:LIMit:TEST OFF|ON|0|1`

`[:SENSe]:CFDRift:LIMit:TEST?`

Turn limit checking on and off.

Factory Preset

and *RST: ON

Remarks: You must be in the Bluetooth mode to use this command. Use INSTRUMENT:SELEct to set the mode.

Front Panel

Access: **Meas Setup**

Carrier Frequency Drift—Trigger Source

```
[ :SENSe ]:CFDRift:TRIGger:SOURce IMMEDIATE | EXTERNAL | RFBURST  
[ :SENSe ]:CFDRift:TRIGger:SOURce?
```

Select the trigger source used to control the data acquisitions.

IMMEDIATE - the next data acquisition is immediately taken (also called Free Run).

EXTERNAL - rear panel external trigger input.

RFBURST – RF burst envelope trigger that has automatic level control for periodic burst signals (Option B7E required).

Factory Preset
and *RST: RFBURST

Remarks: You must be in the Bluetooth mode to use this command. Use INSTRUMENT:SELEct to set the mode.

Front Panel
Access: **Meas Setup, Trig Source**

Carrier Frequency Drift—View Offset

```
[ :SENSe ]:CFDRift:VOFFset <real number>  
[ :SENSe ]:CFDRift:VOFFset?
```

Offset the trace displayed on the screen.

Factory Preset
and *RST: 0.00 s

Range –4.00 to 4.00 s

Remarks: Although a restart is witnessed on changing this parameter it is not a full restart and only changes the trace position on the screen, not the results being calculated.

You must be in the Bluetooth mode to use this command. Use INSTRUMENT:SELEct to set the mode.

Front Panel
Access: **Meas Setup**

Channel Commands

Frequency Hopping

`[:SENSE]:CHANnel:FHOPping OFF|ON|0|1`

`[:SENSE]:CHANnel:FHOPping?`

Turns frequency hopping off or on.

Factory Preset

and *RST: OFF

Remarks: Global to the current mode.

You must be in the Bluetooth mode to use this command. Use
INSTrument:SELEct to set the mode.

Front Panel

Access: **Mode Setup, Radio**

Channel Number

`[:SENSE]:CHANnel[:NUMBER] <integer>`

`[:SENSE]:CHANnel[:NUMBER]?`

Set the analyzer to a frequency that corresponds to the channel number.

Factory Preset

and *RST: 0

Range: 0 to 78

Remarks: Global to the current mode.

You must be in the Bluetooth mode to use this command. Use
INSTrument:SELEct to set the mode.

Front Panel

Access: **FREQUENCY Channel, Channel**

Channel Software Enhanced Triggering

[:SENSe] :CHANnel :SETRiggering On | Off | 1 | 0

[:SENSe] :CHANnel :SETRiggering?

Set the analyzer to set software enhanced triggering On or Off. When switched to “on” traces acquired using external or RF burst trigger will be verified for correctness before any processing upon them is carried out. A trace would be considered incorrect if the trace had been acquired either:

1. During a hardware mis-trigger (perhaps due to a noisy signal or out of spec conditions)
2. From an incorrect external trigger signal if the carrier were on another hopping channel.

In these cases the most recently acquired trace would be automatically rejected and another trace would be taken. The same process would be repeated until a valid trace was acquired.

Factory Preset
and *RST: Off

Remarks: Global to the current mode.

You must be in the Bluetooth mode to use this command. Use INSTRument:SElect to set the mode.

Front Panel
Access: **Mode Setup, Radio...**

Signal Corrections Commands

Correction For External Gain

[:SENSe] :CORRection :GAIN <dB>

[:SENSe] :CORRection :GAIN?

Set equal to the gain of an external amplifier.

Factory Preset
and *RST: 0.00 dB

Range: 0 to 65.00 dB

Default Unit: dB

Remarks: Global to the current mode.

You must be in the Bluetooth mode to use this command. Use INSTRument:SElect to set the mode.

Front Panel
Access: **Mode Setup, Input....**

Correction For External Loss

[:SENSe]:CORRection:LOSS <dB>

[:SENSe]:CORRection:LOSS?

Set equal to the external attenuation.

Factory Preset

and *RST: 0.00 dB

Range: 0 to 65.00 dB

Default Unit: dB

Remarks: Global to the current mode.

You must be in the Bluetooth mode to use this command. Use
INSTrument:SELEct to set the mode.

Front Panel

Access: **Mode Setup, Input....**

Default Reset

[:SENSe]:DEFaults

Restores personality Mode Setup defaults.

Front Panel

Access: **Mode Setup**

Remarks: This command sets all the SENSe defaults but has no effect on
the MEASure default settings. Use the
CONFIgure:<measurement> command to set measurement
defaults

Maximum Deviation

[:SENSe]:DEVIation <freq>

[:SENSe]:DEVIation?

Sets the expected maximum deviation of the Bluetooth modulation.

Default Unit: Hz

Front Panel

Access: **Mode Setup, Demod...**

Frequency Commands

Auto Frequency

[:SENSe] :FREQuency:AUTO

Whenever this command is issued, the frequency will be set to the channel nearest to the strongest signal within the Bluetooth operating frequencies. No validation of the signal is conducted.

Remarks: You must be in the Bluetooth mode to use this command. Use INSTRument:SElect to set the mode.

Front Panel

Access: **FREQUENCY/Channel, Auto Channel**

Center Frequency

[:SENSe] :FREQuency:CENTer <freq>

[:SENSe] :FREQuency:CENTer?

Set the center frequency.

Factory Preset

and *RST: ESA E4402B, E4403B: 1.5 GHz for SA

ESA E4404B: 3.35 GHz for SA

ESA E4405B: 6.6 GHz for SA

ESA E4407B, E4408B: 13.25 GHz for SA

942.6 MHz for GSM

The first channel in the current tuning plan, for cdmaOne.

2.40200 GHz for Bluetooth

Range: ESA E4402B, E4403B: -80 MHz to 3.10 GHz for SA

ESA E4404B: -80 MHz to 6.78 GHz for SA

ESA E4405B: -80 MHz to 13.3 GHz for SA

ESA E4407B, E4408B: -80 MHz to 27.0 GHz for SA

942.6 MHz for GSM

The same as the SA range for cdmaOne

2.400 to 2.4835 GHz for Bluetooth

Default Unit: Hz

Remarks: Global to the current mode.

Front Panel

Access: *For ESA SA, GSM, and Bluetooth*
FREQUENCY/Channel, Center Freq
For ESA cdmaOne
FREQUENCY/Channel, Channel Freq

Initial Carrier Frequency Tolerance Measurement

Commands for querying the initial carrier frequency tolerance measurement results and for setting to the default values are found in the MEASure group of commands. The equivalent front panel keys for the parameters described in the following commands, are found under the **Meas Setup** key, after the **Init Carrier Freq Tol** measurement has been selected from the **MEASURE** key menu.

Initial Carrier Frequency Tolerance—Average Count

```
[ :SENSE ] :ICFTol :AVERage :COUNT <integer>
```

```
[ :SENSe ] :ICFTol :AVERage :COUNT?
```

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

Factory Preset

and *RST: 10

Range: 1 to 1000

Remarks: You must be in the Bluetooth mode to use this command. Use INSTRument:SElect to set the mode.

Front Panel

Access: **Meas Setup, Avg Number**

Initial Carrier Frequency Tolerance—Averaging State

```
[ :SENSE ] :ICFTol :AVERage [ :STATe ] OFF | ON | 0 | 1
```

```
[ :SENSe ] :ICFTol :AVERage [ :STATe ]?
```

Turn averaging on or off.

Factory Preset

and *RST: ON

Remarks: You must be in the Bluetooth mode to use this command. Use INSTRument:SElect to set the mode.

Front Panel

Access: **Meas Setup, Avg Number**

Initial Carrier Frequency Tolerance—Averaging Termination Control

`[:SENSE] : ICFTol : AVERage : TCONtrol EXPonential | REPEAT`

`[:SENSE] : ICFTol : AVERage : TCONtrol ?`

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

EXPonential - Each successive data acquisition after the average count is reached, is exponentially weighted and combined with the existing average.

REPEAT - After reaching the average count, the averaging is reset and a new average is started.

Factory Preset

and *RST: EXPonential

Remarks: You must be in the Bluetooth mode to use this command. Use INSTRUMENT:SELEct to set the mode.

Front Panel

Access: **Meas Setup, Avg Mode**

Initial Carrier Frequency Tolerance—Burst Sync Source

`[:SENSE] : ICFTol : BSYnc : SOURce PREamble | NONE`

`[:SENSE] : ICFTol : BSYnc : SOURce ?`

Select how the measurement will synchronize with the correct part of the burst.

PREamble - uses p0 to define the start of the burst and defines the duration as the packet length of the currently selected packet type.

Factory Preset

and *RST: PREamble

Remarks: You must be in the Bluetooth mode to use this command. Use INSTRUMENT:SELEct to set the mode.

Front Panel

Access: **Meas Setup, Burst Sync**

Initial Carrier Frequency Tolerance—1.3 MHz Post-Detection Filter

`[:SENSe] :ICFTol :FILTer ON | OFF | 1 | 0`

`[:SENSe] :ICFTol :FILTer ?`

Turn the 1.3 MHz post-detection filter on and off.

Factory Preset: ON

Remarks: You must be in the Bluetooth mode to use this command. Use INSTRUMENT:SELEct to set the mode.

When the 1.3 MHz post-detection filter is on, the sample rate is set to 10 times oversampling and the sweep time is set to 40 μ s. When the post-detection filter is off, the sample rate reverts to 40 times oversampling, and the sweep time is set to 10 μ s.

Option B7D (DSP with Fast ADC) must be installed for this command to be used. The filter is switched Off if Option B7D is not installed.

Front Panel

Access: **Meas Setup, 1.3MHz Filter**

Initial Carrier Frequency Tolerance—Limit Test

`[:SENSe] :ICFTol :LIMit :TEST OFF | ON | 0 | 1`

`[:SENSe] :ICFTol :LIMit :TEST ?`

Turn limit checking on and off.

Factory Preset
and *RST: ON

Remarks: You must be in the Bluetooth mode to use this command. Use INSTRUMENT:SELEct to set the mode.

Front Panel

Access: **Meas Setup**

Initial Carrier Frequency Tolerance—Trigger Source

```
[ :SENSE ]:ICFTol:TRIGger:SOURce IMMEDIATE|EXTERNAL|RFBURST  
[ :SENSE ]:ICFTol:TRIGger:SOURce?
```

Select the trigger source used to control the data acquisitions.

IMMEDIATE - the next data acquisition is immediately taken (also called Free Run).

EXTERNAL - rear panel external trigger input

RFBURST – RF burst envelope trigger that has automatic level control for periodic burst signals

Factory Preset

and *RST: RFBURST

Remarks: You must be in the Bluetooth mode to use this command. Use INSTRUMENT:SELECT to set the mode.

Front Panel

Access: **Meas Setup, Trig Source**

Modulation Characteristics Measurement

Commands for querying the modulation characteristics measurement results and for setting to the default values are found in the MEASure group of commands. The equivalent front panel keys for the parameters described in the following commands, are found under the **Meas Setup** key, after the **Modulation Chars** measurement has been selected from the **MEASURE** key menu.

Modulation Characteristics—Average Count

[:SENSE] :MChar :AVERAge :COUNT <integer>

[:SENSe] :MChar :AVERAge :COUNT?

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

Factory Preset

and *RST: 10

Range: 1 to 1000

Remarks: You must be in the Bluetooth mode to use this command. Use INSTRument:SElect to set the mode.

Front Panel

Access: **Meas Setup, Avg Number**

Modulation Characteristics—Averaging State

[:SENSE] :MChar :AVERAge [:STATe] OFF | ON | 0 | 1

[:SENSe] :MChar :AVERAge [:STATe]?

Turn averaging on or off.

Factory Preset

and *RST: ON

Remarks: You must be in the Bluetooth mode to use this command. Use INSTRument:SElect to set the mode.

Front Panel

Access: **Meas Setup, Avg Number**

Modulation Characteristics—Averaging Termination Control

[:SENSe] :MChar:AVERage:TCONtrol EXPonential | REPEAT

[:SENSe] :MChar:AVERage:TCONtrol?

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

EXPonential - Each successive data acquisition after the average count is reached, is exponentially weighted and combined with the existing average.

REPEAT - After reaching the average count, the averaging is reset and a new average is started.

Factory Preset

and *RST: EXPonential

Remarks: You must be in the Bluetooth mode to use this command. Use INSTRument:SElect to set the mode.

Front Panel

Access: **Meas Setup, Avg Mode**

Modulation Characteristics—Resolution Bandwidth

`[:SENSE] :MChar :BANDwidth | BWIDth [:RESolution] :
DFONe | DFTwo <freq>`

`[:SENSE] :MChar :BANDwidth | BWIDth [:RESolution] :
DFONe | DFTwo?`

Change the resolution bandwidth filter used when calculating $\Delta f1$ or $\Delta f2$.

Factory Preset

and *RST: $\Delta f1$ and $\Delta f2$ - 5 MHz

Range

The range is dependent on the Frequency Hopping and the 1.3 MHz Filter settings. See Table 2-1 (below) for further details.

Table 2-1

$\Delta f1$ and $\Delta f2$ RBW Range Dependencies

Freq Hopping	1.3 MHz Filter	$\Delta f1$ RBW Range	$\Delta f2$ RBW Range
ON	ON/OFF	Fixed at 3 MHz	Fixed at 3 MHz
OFF	ON	Fixed at 5 MHz	Fixed at 5 MHz
OFF	OFF	10 Hz to 5 MHz	10 Hz to 5 MHz

Remarks:

You must be in the Bluetooth mode to use this command. Use `INSTrument:SElect` to set the mode.

This command can only be used to change the $\Delta f1$ or the $\Delta f2$ RBW setting if both the 1.3 MHz filter and Frequency Hopping are switched Off.

Front Panel

Access: **Meas Setup, Advanced**

Modulation Characteristics—Burst Sync Source

`[:SENSE] :MChar:BSync:SOURCE PReamble |NONE`

`[:SENSE] :MChar:BSync:SOURCE?`

Select how the measurement will synchronize with the correct part of the burst.

PREamble - uses p0 to define the start of the burst and defines the duration as the packet length of the currently selected packet type.

Factory Preset

and *RST: PReamble

Remarks: You must be in the Bluetooth mode to use this command. Use INSTRUMENT:SELEct to set the mode.

Front Panel

Access: **Meas Setup, Burst Sync**

Modulation Characteristics—1.3 MHz Post-Detection Filter

`[:SENSE] :MChar:FILTer ON |OFF |1 |0`

`[:SENSE] :MChar:FILTer?`

Turn the 1.3 MHz post-detection filter on and off.

Factory Preset: ON

Remarks: You must be in the Bluetooth mode to use this command. Use INSTRUMENT:SELEct to set the mode.

Option B7D (DSP with Fast ADC) must be installed for this command to be used. The filter is switched Off if Option B7D is not installed.

Front Panel

Access: **Meas Setup, 1.3MHz Filter**

Modulation Characteristics—Hold Result

[:SENSE] :MChar:HREsult OFF | DF1 | DF2

[:SENSe] :MChar:HREsult?

Store the measurement result for either $\Delta f1$ Avg or $\Delta f2$ Avg depending on which result has been measured.

Factory Preset
and *RST: OFF

Remarks: **Hold Result** may not be used when:

the measurement has not completed the full number of averages, or

the measurement is in the idle state and the result data is or has become invalid.

You must be in the Bluetooth mode to use this command.
Use INSTRument:SElect to set the mode.

Front Panel
Access: **Meas Setup, Hold Result**

Modulation Characteristics—Limit Test

[:SENSE] :MChar:LIMit:TEST OFF | ON | 0 | 1

[:SENSe] :MChar:LIMit:TEST?

Turn limit checking on and off.

Factory Preset
and *RST: ON

Remarks: You must be in the Bluetooth mode to use this command. Use INSTRument:SElect to set the mode.

Front Panel
Access: **Meas Setup**

Modulation Characteristics—Payload Data

[:SENSe] :MCHar:PDATa AUTO | LFPattern | HFPattern

[:SENSe] :MCHar:PDATa?

Choose the expected payload data pattern (**11110000** or **10101010**), or to let the measurement auto-detect the pattern.

AUTO - the measurement will auto-detect the pattern.

LFPattern - selects the 11110000 pattern.

HFPattern - selects the 10101010 pattern.

Factory Preset

and *RST: AUTO

Remarks: If you select **Auto**, then the measurement will complete successfully only if one of the two expected patterns is received. If the pattern is not received, the measurement will abort to the idle state, although it will not invalidate any previously attained results that have been held using SENSe:MCHar:HRESult.

You must be in the Bluetooth mode to use this command. Use INSTRument:SELEct to set the mode.

Front Panel

Access: **Meas Setup, Payload Data**

Modulation Characteristics—Trigger Source

[:SENSe] :MCHar:TRIGger:SOURce IMMEDIATE | EXTERNAL | RFBURST

[:SENSe] :MCHar:TRIGger:SOURce?

Select the trigger source used to control the data acquisitions.

IMMEDIATE - the next data acquisition is immediately taken (also called Free Run).

EXTERNAL - rear panel external trigger input.

RFBURST - RF burst envelope trigger that has automatic level control for periodic burst signals (Option B7E required).

Factory Preset

and *RST: RFBURST

Remarks: You must be in the Bluetooth mode to use this command. Use INSTRument:SELEct to set the mode.

Front Panel

Access: **Meas Setup, Trig Source**

Monitor Band/Channel Measurement

Commands for querying the monitor band/channel measurement results and for setting to the default values are found in the MEASure group of commands. The equivalent front panel keys for the parameters described in the following commands, are found under the **Meas Setup** key, after the **Monitor Band/Channel** measurement has been selected from the **MEASURE** key menu.

Monitor Band/Channel—Average Count

```
[ :SENSE ]:MONitor:AVERage:COUNT <integer>
```

```
[ :SENSE ]:MONitor:AVERage:COUNT?
```

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

Factory Preset
and *RST: 10

Range: 1 to 1,000

Remarks: You must be in the Bluetooth, cdmaOne, or GSM mode to use this command. Use INSTRument:SElect to set the mode.

Front Panel
Access: **Meas Setup, Avg Number**

Monitor Band/Channel—Averaging State

```
[ :SENSE ]:MONitor:AVERage[ :STATE ] OFF|ON|0|1
```

```
[ :SENSE ]:MONitor:AVERage[ :STATE ]?
```

Turn averaging on or off.

Factory Preset
and *RST: ON for GSM, Bluetooth
OFF for cdmaOne

Remarks: You must be in the Bluetooth, cdmaOne, or GSM mode to use this command. Use INSTRument:SElect to set the mode.

Front Panel
Access: **Meas Setup, Avg Number**

Monitor Band/Channel—Averaging Termination Control

```
[ :SENSE ]:MONitor:AVERage:TCONTROL EXPonential|REPEAT
```


[:SENSe]:MONitor:AVERage:TCONtrol?

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

EXPonential - After the average count is reached, each successive data acquisition is exponentially weighted and combined with the existing average.

REPeat - After reaching the average count, the averaging is reset and a new average is started.

Factory Preset

and *RST: EXPonential

Remarks: You must be in the Bluetooth, cdmaOne, or GSM mode to use this command. Use INSTRument:SElect to set the mode.

Front Panel

Access: **Meas Setup, Avg Mode**

Monitor Band/Channel—Band Method Resolution Bandwidth

```
[ :SENSE ] :MONitor :BAND :BANDwidth | BWIDth [ :RESolution ] <freq>  
[ :SENSE ] :MONitor :BAND :BANDwidth | BWIDth [ :RESolution ] ?
```

Set the value of the resolution bandwidth for the band method of the monitor band/channel measurement. If span is set to a value greater than 5 MHz, minimum resolution bandwidth is limited to 1 kHz.

Factory Preset

and *RST: 100 kHz

Range: Option 1DR — 10 Hz to 5 MHz
non-Option 1DR — 1 kHz to 5 MHz

Default Unit: Hz

Remarks: You must be in the Bluetooth mode to use this command. Use INSTRument:SElect to set the mode.

Front Panel

Access: **Meas Setup, Band Setup, Res BW**

Monitor Band/Channel—Band Method Video Bandwidth

```
[ :SENSe ] :MONitor :BAND :BANDwidth | BWIDth :VIDeo <freq>  
[ :SENSe ] :MONitor :BAND :BANDwidth | BWIDth :VIDeo ?
```

Set the video bandwidth for the band method of the monitor band/channel measurement.

Factory Preset

and *RST: 100 kHz

Range: 30 Hz to 3 MHz

Default Unit: Hz

Remarks: You must be in the Bluetooth mode to use this command. Use INSTRument:SElect to set the mode.

Front Panel

Access: **Meas Setup, Band Setup, Video BW**

Monitor Band/Channel—Band Method Detector Mode

```
[ :SENSe]:MONitor:BAND:DETEctor POSitive|SAMPlE|NEGative
[ :SENSe]:MONitor:BAND:DETEctor?
```

Set the detector mode type for the band method of the monitor band/channel measurement.

POSitive - positive peak detection displays the highest sample taken during the interval being displayed.

SAMPlE - sample detection displays the first sample taken during the interval being displayed.

NEGative - negative peak detection displays the lowest sample taken during the interval being displayed.

Factory Preset

and *RST: POSitive

Remarks: You must be in the Bluetooth, cdmaOne, or GSM mode to use this command. Use INSTRument:SELEct to set the mode.

Front Panel

Access: **Meas Setup, Band Setup, Detector**

Monitor Band/Channel—Band Method Maximum Hold Trace Average State

```
[ :SENSe]:MONitor:BAND:MAXHold[ :STATe] OFF|ON|0|1
[ :SENSe]:MONitor:BAND:MAXHold[ :STATe]?
```

Turn maximum hold trace average feature on or off for the band method of the monitor band/channel measurement.

Factory Preset

and *RST: OFF

Remarks: You must be in the Bluetooth, cdmaOne, or GSM mode to use this command. Use INSTRument:SELEct to set the mode.

Front Panel

Access: **Meas Setup, Band Setup, Max Hold**

Monitor Band/Channel—Band Method Frequency Span

[:SENSe] :MONitor :BAND :SPAN <freq>

[:SENSe] :MONitor :BAND :SPAN?

Set the frequency span of the monitor band measurement. If resolution bandwidth is set to a value less than 1 kHz, maximum span is limited to 5 MHz.

Factory Preset

and *RST: Full (Uses the full span of the selected standard.)
for cdmaOne

103.5 MHz for Bluetooth

Range: ESA range

Default Unit: Hz

Remarks: You must be in the Bluetooth or cdmaOne mode to use this
command. Use INSTRument:SElect to set the mode.

Front Panel

Access: **Meas Setup, Edit Table** for cdmaOne

Span for Bluetooth

Monitor Band/Channel—Band Sweep Time

[:SENSe] :MONitor :BAND :SWEep :TIME <real number>

[:SENSe] :MONitor :BAND :SWEep :TIME?

Set the sweep time.

Factory Preset

and *RST: 2 s

Range: 5 ms to 2 ks

Default Unit: Seconds

Remarks: You must be in the Bluetooth mode to use this command. Use
INSTRument:SElect to set the mode.

Front Panel

Access: **Meas Setup, Band Setup, Sweep Time**

Monitor Band/Channel—Band Sweep Time Auto

[:SENSE]:MONitor:BAND:SWEep:TIME:AUTO OFF|ON|0|1

[:SENSe]:MONitor:BAND:SWEep:TIME:AUTO?

Select auto or manual control of the sweep (acquisition) time. This is an advanced control that normally does not need to be changed.

AUTO - couples the Sweep Time to the Frequency Span and Resolution BW

Manual - the Sweep Time is uncoupled from the Frequency Span and Resolution BW.

Factory Preset
and *RST:

AUTO

Remarks: You must be in the Bluetooth mode to use this command. Use INSTRument:SElect to set the mode.

Front Panel

Access: **Meas Setup, Band Setup, Sweep Time**

Monitor Band/Channel—Channel Span

[:SENSe]:MONitor:CHANnel SINGLE|TRIPLE

[:SENSe]:MONitor:CHANnel?

Switch view between a single or triple channel display.

Factory Preset
and *RST:

SINGLE

Remarks: You must be in Bluetooth or GSM mode to use this command. Use INSTRument:SElect to set the mode.

Front Panel

Access: **Meas Setup, Channel Span**

Monitor Band/Channel—Channel Method Resolution Bandwidth

```
[ :SENSE ] :MONitor :CHANnel :BANDwidth | BWIDth [ :RESolution ]  
<freq>
```

```
[ :SENSE ] :MONitor :CHANnel :BANDwidth | BWIDth [ :RESolution ] ?
```

Set the resolution bandwidth for the channel method of the monitor band/channel measurement. If span is set to a value greater than 5 MHz, minimum resolution bandwidth is limited to 1 kHz.

Factory Preset

and *RST: 10 kHz for GSM

30 kHz for cdmaOne

100 kHz for Bluetooth

Range: Option 1DR—10 Hz to 5 MHz

non-Option 1DR—1 kHz to 5 MHz

Default Unit: Hz

Remarks: You must be in the Bluetooth, cdmaOne, or GSM mode to use this command. Use INSTRUMENT:SElect to set the mode.

Front Panel

Access: **Meas Setup, Chan Setup, Res BW**

Monitor Band/Channel—Channel Method Video Bandwidth

```
[ :SENSE ] :MONitor :CHANnel :BANDwidth | BWIDth :VIDeo <freq>
```

```
[ :SENSE ] :MONitor :CHANnel :BANDwidth | BWIDth :VIDeo ?
```

Set the video bandwidth for the channel method of the monitor band/channel measurement.

Factory Preset

and *RST: 10 kHz for GSM

30 kHz for cdmaOne

100 kHz for Bluetooth

Range: Option 1DR—30 Hz to 3 MHz

non- Option 1DR—1 kHz to 3 MHz

Default Unit: Hz

Remarks: You must be in the Bluetooth, cdmaOne, or GSM mode to use this command. Use INSTRUMENT:SElect to set the mode.

Front Panel

Access: **Meas Setup, Chan Setup, Video BW**

Monitor Band/Channel—Channel Method Detector Mode

```
[ :SENSE]:MONitor:CHANnel:DETEctor POSitive|SAMPlE|NEGative
[ :SENSe]:MONitor:CHANnel:DETEctor?
```

Set the detector mode type for the channel method of the monitor band/channel measurement.

POSitive - positive peak detection displays the highest sample taken during the interval being displayed.

SAMPlE - sample detection displays the first sample taken during the interval being displayed.

NEGative - negative peak detection displays the lowest sample taken during the interval being displayed.

Factory Preset

and *RST: POSitive

Remarks: You must be in the Bluetooth, cdmaOne, or GSM mode to use this command. Use INSTRument:SELEct to set the mode.

Front Panel

Access: **Meas Setup, Chan Setup, Detector**

Monitor Band/Channel—Channel Method Maximum Hold Trace Average State

```
[ :SENSE]:MONitor:CHANnel:MAXHold[ :STATe] OFF|ON|0|1
[ :SENSe]:MONitor:CHANnel:MAXHold[ :STATe]?
```

Turn maximum hold trace average feature on or off for the channel method of the monitor band/channel measurement. When max hold is turned on, trace averaging is turned off.

Factory Preset

and *RST: OFF

Remarks: You must be in the Bluetooth, cdmaOne, or GSM mode to use this command. Use INSTRument:SELEct to set the mode.

Front Panel

Access: **Meas Setup, Chan Setup, Max Hold**

Monitor Band/Channel—Channel Sweep Time

[:SENSE] :MONitor :CHANnel :SWEep :TIME <real number>

[:SENSE] :MONitor :CHANnel :SWEep :TIME?

Set the sweep time.

Factory Preset

and *RST: 2 s

Range: 5 ms to 2 ks

Default Unit: Seconds

Remarks: You must be in the Bluetooth mode to use this command. Use INSTRument:SElect to set the mode.

Front Panel

Access: **Meas Setup, Channel Setup, Sweep Time**

Monitor Band/Channel—Channel Sweep Time Auto

[:SENSE] :MONitor :CHANnel :SWEep :TIME :AUTO OFF | ON | 0 | 1

[:SENSE] :MONitor :CHANnel :SWEep :TIME :AUTO?

Select auto or manual control of the sweep (acquisition) time. This is an advanced control that normally does not need to be changed.

AUTO - couples the Sweep Time to the Frequency Span and Resolution BW

Manual - the Sweep Time is uncoupled from the Frequency Span and Resolution BW.

Factory Preset

and *RST: AUTO

Remarks: You must be in the Bluetooth mode to use this command. Use INSTRument:SElect to set the mode.

Front Panel

Access: **Meas Setup, Channel Setup, Sweep Time**

Monitor Band/Channel—Method Selection

[:SENSe]:MONitor:METHOD CHANNEL | BAND

[:SENSe]:MONitor:METHOD?

Sets the monitor measurement method to either channel or band.

Factory Preset

and *RST: BAND

Remarks: You must be in the Bluetooth, cdmaOne, or GSM mode to use this command. Use INSTRument:SElect to set the mode.

Front Panel

Access: **Meas Setup, Method**

Modulation Overview Measurement

Commands for querying the modulation overview measurement results and for setting to the default values are found in the MEASure group of commands. The equivalent front panel keys for the parameters described in the following commands, are found under the **Meas Setup** key, after the **Modulation Overview** measurement has been selected from the **MEASURE** key menu.

Modulation Overview—Average Count

[:SENSe]:MOVerview:AVERAge:COUNT <integer>

[:SENSe]:MOVerview:AVERAge:COUNT?

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

Factory Preset

and *RST: 10

Range: 1 to 1000

Remarks: You must be in the Bluetooth mode to use this command. Use INSTRument:SElect to set the mode.

Front Panel

Access: **Meas Setup, Avg Number**

Modulation Overview—Averaging State

```
[ :SENSE]:MOVerview:AVERAge[ :STATE] OFF|ON|0|1  
[ :SENSE]:MOVerview:AVERAge[ :STATE]?
```

Turn averaging on or off.

Factory Preset
and *RST: ON

Remarks: You must be in the Bluetooth mode to use this command. Use
INSTrument:SELEct to set the mode.

Front Panel
Access: **Meas Setup, Avg Number**

Modulation Characteristics—Averaging Termination Control

```
[ :SENSE]:MOVerview:AVERAge:TCONTRol EXPonential|REPEat  
[ :SENSE]:MOVerview:AVERAge:TCONTRol?
```

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

EXPonential - Each successive data acquisition after the average count is reached, is exponentially weighted and combined with the existing average.

REPEat - After reaching the average count, the averaging is reset and a new average is started.

Factory Preset
and *RST: EXPonential

Remarks: You must be in the Bluetooth mode to use this command. Use
INSTrument:SELEct to set the mode.

Front Panel
Access: **Meas Setup, Avg Mode**

Modulation Overview—Burst Sync Source

`[:SENSE]:MOVerview:BSYNc:SOURce PREamble |NONE`

`[:SENSe]:MOVerview:BSYNc:SOURce?`

Select how the measurement will synchronize with the correct part of the burst.

PREamble - uses p0 to define the start of the burst and defines the duration as the packet length of the currently selected packet type.

Factory Preset

and *RST: PREamble

Remarks: You must be in the Bluetooth mode to use this command. Use INSTRument:SElect to set the mode.

Front Panel

Access: **Meas Setup, Burst Sync**

Modulation Overview—1.3 MHz Post-Detection Filter

`[:SENSE]:MOVerview:FILTer ON |OFF |1 |0`

`[:SENSe]:MOVerview:FILTer?`

Turn the 1.3 MHz post-detection filter on and off.

Factory Preset: ON

Remarks: You must be in the Bluetooth mode to use this command. Use INSTRument:SElect to set the mode.

Option B7D (DSP with Fast ADC) must be installed for this command to be used. The filter is switched Off if Option B7D is not installed.

Front Panel

Access: **Meas Setup, 1.3MHz Filter**

Modulation Overview—Trigger Source

```
[ :SENSe ] :MOVerview:TRIGger:SOURce  
IMMEDIATE | EXTERNAL | RFBURST
```

```
[ :SENSe ] :MOVerview:TRIGger:SOURce?
```

Select the trigger source used to control the data acquisitions.

IMMEDIATE - the next data acquisition is immediately taken (also called Free Run).

EXTERNAL - rear panel external trigger input

RFBURST - RF burst envelope trigger that has automatic level control for periodic burst signals

Factory Preset

and *RST: RFBURST (or EXTERNAL if option B7E is not present)

Remarks: You must be in the Bluetooth mode to use this command. Use INSTRUMENT:SELECT to set the mode.

Front Panel

Access: **Meas Setup, Trig Source**

Modulation Overview—View Offset

```
[ :SENSe ] :MOVerview:VOFFset <real number>
```

```
[ :SENSe ] :MOVerview:VOFFset?
```

Offset the trace displayed on the screen.

Factory Preset

and *RST: 0.00 s

Range -4.00 to 4.00 s

Remarks: Although a restart is witnessed on changing this parameter it is not a full restart and only changes the trace position on the screen, not the results being calculated.

You must be in the Bluetooth mode to use this command. Use INSTRUMENT:SELECT to set the mode.

Front Panel

Access: **Meas Setup**

Output Power Measurement

Commands for querying the output power measurement results and for setting to the default values are found in the MEASURE group of commands. The equivalent front panel keys for the parameters described in the following commands, are

found under the **Meas Setup** key, after the **Output Power** measurement has been selected from the **MEASURE** key menu.

Output Power—Average Count

[:SENSe] :OPOWER :AVERAge :COUNT <integer>

[:SENSe] :OPOWER :AVERAge :COUNT?

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

Factory Preset

and *RST: 10

Range: 1 to 1000

Remarks: You must be in the Bluetooth mode to use this command. Use INSTRument:SELEct to set the mode.

Front Panel

Access: **Meas Setup, Avg Number**

Output Power—Averaging State

[:SENSe] :OPOWER :AVERAge [:STATe] OFF | ON | 0 | 1

[:SENSe] :OPOWER :AVERAge [:STATe]?

Turn averaging on or off.

Factory Preset

and *RST: ON

Remarks: You must be in the Bluetooth mode to use this command. Use INSTRument:SELEct to set the mode.

Front Panel

Access: **Meas Setup, Avg Number**

Output Power—Averaging Termination Control

[:SENSe] :OPOWER :AVERAge :TCONTRol EXPonential | REPEAT

[:SENSe] :OPOWER :AVERAge :TCONTRol?

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

EXPonential - Each successive data acquisition after the average count is reached, is exponentially weighted and combined with the existing average.

Language Reference
SENSe Subsystem

REPeat - After reaching the average count, the averaging is reset and a new average is started.

Factory Preset
and *RST: EXPOnential

Remarks: You must be in the Bluetooth mode to use this command. Use
INSTrument:SELEct to set the mode.

Front Panel
Access: **Meas Setup, Avg Mode**

Output Power—Average Type

[:SENSE] :OPOWER :AVERAGE :TYPE LPOWER | POWER

[:SENSE] :OPOWER :AVERAGE :TYPE?

Successive measurements of data can be combined together to average out measurement variations.

LPOWER - linear power, also called video. Selects a digital averaging routine that averages on a point-by-point basis over a number of successive sweeps.

POWER - selects power averaging which is performed by converting the trace data from dB to power units, and then averaging the power trace data.

Factory Preset

and *RST: POWER

Remarks: You must be in the Bluetooth mode to use this command. Use INSTRUMENT:SELECT to set the mode.

Front Panel

Access: **Meas Setup, Avg Type**

Output Power—Burst Sync Source

[:SENSE] :OPOWER :BSYNC :SOURCE PREAMBLE | RFAMPLITUDE | NONE

[:SENSE] :OPOWER :BSYNC :SOURCE?

Select how the measurement will synchronize with the correct part of the burst.

PREAMBLE - uses p0 to define the start of the burst and defines the duration as the packet length of the currently selected packet type.

RFAMPLITUDE - defines the duration of the burst as the time between the leading and trailing 3 dB points compared to the average power.

Factory Preset

and *RST: PREAMBLE

Remarks: You must be in the Bluetooth mode to use this command. Use INSTRUMENT:SELECT to set the mode.

Front Panel

Access: **Meas Setup, Burst Sync**

Output Power—Limit Test

```
[ :SENSe ] :OPower:LIMit:TEST OFF|ON|0|1
```

```
[ :SENSe ] :OPower:LIMit:TEST?
```

Turns limit checking on and off. This is not the same as limit lines – the numeric peak and average power results are checked against the Peak Upper Limit, Avg Upper Limit and Avg Lower Limit parameters to see if they meet the limit requirements.

Factory Preset
and *RST: ON

Remarks: You must be in the Bluetooth mode to use this command. Use INSTRument:SElect to set the mode.

Front Panel
Access: **Meas Setup, Limit Test**

Output Power—Start Marker

```
[ :SENSe ] :OPower:START <real number>
```

```
[ :SENSe ] :OPower:START?
```

Set the point at which averaging of the power should begin. It is defined as a percentage of the burst length. The difference between the stop and start marker must be at least 1%.

Factory Preset
and *RST: 20.00%

Range 0.00 to 99.00%

Remarks: You must be in the Bluetooth mode to use this command. Use INSTRument:SElect to set the mode.

Front Panel
Access: **Meas Setup, Start Marker**

Output Power—Stop Marker

`[:SENSe] :OPOWER :STOP <real number>`

`[:SENSe] :OPOWER :STOP?`

Set the point at which averaging of the power should stop. It is defined as a percentage of the burst length. The difference between the stop and start marker must be at least 1%.

Factory Preset

and *RST: 80.00%

Range 1.00 to 100.00%

Remarks: You must be in the Bluetooth mode to use this command. Use INSTRUMENT:SELEct to set the mode.

Front Panel

Access: **Meas Setup, Stop Marker**

Output Power—Trigger Source

`[:SENSe] :OPOWER :TRIGger :SOURCE
IMMediate | EXTErnal | RFBurst | VIDEo`

`[:SENSe] :OPOWER :TRIGger :SOURCE?`

Select the trigger source used to control the data acquisitions.

IMMediate - the next data acquisition is immediately taken (also called Free Run).

EXTErnal - rear panel external trigger input.

RFBurst – RF burst envelope trigger that has automatic level control for periodic burst signals (Option B7E required).

VIDEo – Activates the trigger condition that allows the next sweep to start if the detected RF envelope voltage rises to a level set by the video trigger level. The analyzer triggers when the input signal exceeds the trigger level at the left edge of the display.

Factory Preset

and *RST: RFBurst

Remarks: You must be in the Bluetooth mode to use this command. Use INSTRUMENT:SELEct to set the mode.

Front Panel

Access: **Meas Setup, Trig Source**

Output Spectrum Bandwidth Measurement

Commands for querying the output spectrum bandwidth measurement results and for setting to the default values are found in the MEASure group of commands. The equivalent front panel keys for the parameters described in the following commands, are found under the **Meas Setup** key, after the **Output Spectrum BW** measurement has been selected from the **MEASURE** key menu.

Output Spectrum Bandwidth—Average Count

```
[ :SENSE ] :OSBWidth :AVERAge :COUNT <integer>
```

```
[ :SENSe ] :OSBWidth :AVERAge :COUNT?
```

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

Factory Preset

and *RST: 10

Range: 1 to 1000

Remarks: You must be in the Bluetooth mode to use this command. Use INSTRument:SElect to set the mode.

Front Panel

Access: **Meas Setup, Avg Number**

Output Spectrum Bandwidth—Averaging State

```
[ :SENSE ] :OSBWidth :AVERAge [ :STATe ] OFF | ON | 0 | 1
```

```
[ :SENSe ] :OSBWidth :AVERAge [ :STATe ]?
```

Turn averaging on or off.

Factory Preset

and *RST: ON

Remarks: You must be in the Bluetooth mode to use this command. Use INSTRument:SElect to set the mode.

Front Panel

Access: **Meas Setup, Avg Number**

Output Spectrum Bandwidth—Averaging Termination Control

```
[ :SENSe ]:OSBWidth:AVERAge:TCONtrol EXPonential | REPeat
[ :SENSe ]:OSBWidth:AVERAge:TCONtrol?
```

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

EXPonential - Each successive data acquisition after the average count is reached, is exponentially weighted and combined with the existing average.

REPeat - After reaching the average count, the averaging is reset and a new average is started.

Factory Preset

and *RST: EXPonential

Remarks: You must be in the Bluetooth mode to use this command. Use INSTRument:SElect to set the mode.

Front Panel

Access: **Meas Setup, Avg Mode**

Output Spectrum Bandwidth—Bandwidth Resolution

```
[ :SENSe ]:OSBWidth:BAND[RESolution] <freq>
[ :SENSe ]:OSBWidth:BAND[RESolution]?
```

Set the resolution bandwidth that will be used.

Factory Preset

and *RST: 10 kHz

Range: 1 kHz to 5 MHz

Default Unit: Hz

Remarks: You must be in the Bluetooth mode to use this command. Use INSTRument:SElect to set the mode.

Front Panel

Access: **Meas Setup, Advanced, Res Bw**

Output Spectrum Bandwidth—Span

[:SENSe] :OSEWidth :BAND :SPAN <freq>

[:SENSe] :OSEWidth :BAND :SPAN?

Set the instrument span.

Factory Preset
and *RST: 2 MHz

Range: ESA model dependent.

Remarks: You must be in the Bluetooth, cdmaOne, or GSM mode to use this command. Use INSTRument:SElect to set the mode.

Front Panel
Access: **Meas Setup, Advanced, Span**

Output Spectrum Bandwidth—Video Bandwidth

[:SENSe] :OSEWidth :BAND :VIDeo <freq>

[:SENSe] :OSEWidth :BAND :VIDeo?

Set the video bandwidth that will be used.

Factory Preset
and *RST: 30 kHz

Range: 30 Hz to 3 MHz

Default Unit: Hz

Remarks: You must be in the Bluetooth mode to use this command. Use INSTRument:SElect to set the mode.

Front Panel
Access: **Meas Setup, Advanced, Video BW**

Output Spectrum Bandwidth—Limit Test

[:SENSe] :OSEWidth :LIMit :TEST OFF | ON | 0 | 1

[:SENSe] :OSEWidth :LIMit :TEST?

Turn limit checking on and off.

Factory Preset
and *RST: ON

Remarks: You must be in the Bluetooth mode to use this command. Use INSTRument:SElect to set the mode.

Front Panel
Access: **Meas Setup**

Output Spectrum Bandwidth—Maximum Hold Trace Average State

[:SENSE]:OSBwidth:MAXHold[:STATE] OFF|ON|0|1

[:SENSE]:OSBwidth:MAXHold[:STATE]?

Turn maximum hold trace feature on or off. When max hold is turned on, trace averaging is turned off.

Factory Preset
and *RST: ON

Remarks: You must be in the Bluetooth mode to use this command. Use INSTRUMENT:SELEct to set the mode.

Front Panel
Access: **Meas Setup, Advanced, Max Hold**

Output Spectrum Bandwidth—Sweep Time

[:SENSE]:OSBwidth:SWEep:TIME <real number>

[:SENSE]:OSBwidth:SWEep:TIME?

Set the sweep time.

Factory Preset
and *RST: 1 s

Range: 5 ms to 4 ks

Default Unit: Seconds

Remarks: You must be in the Bluetooth mode to use this command. Use INSTRUMENT:SELEct to set the mode.

Front Panel
Access: **Meas Setup, Advanced, Sweep Time**

Output Spectrum Bandwidth—Sweep Time Auto

`[:SENSe] :OSEWidth :SWEep :TIME :AUTO OFF | ON | 0 | 1`

`[:SENSe] :OSEWidth :SWEep :TIME :AUTO?`

Select auto or manual control of the sweep (acquisition) time. This is an advanced control that normally does not need to be changed.

AUTO - couples the Sweep Time to the Frequency Span and Resolution BW

Manual - the Sweep Time is uncoupled from the Frequency Span and Resolution BW.

Factory Preset
and *RST: AUTO

Remarks: You must be in the Bluetooth mode to use this command. Use
 INSTrument:SElect to set the mode.

Output Spectrum Bandwidth—Bandwidth

`[:SENSe] :OSEWidth :XDB <dB>`

`[:SENSe] :OSEWidth :XDB?`

Set the level of the markers that will determine the measured output spectrum bandwidth.

Factory Preset
and *RST: -20 dB
Range: -50 dB to -5 dB
Default Unit: dB

Remarks: You must be in the Bluetooth mode to use this command. Use
 INSTrument:SElect to set the mode.

Front Panel
Access: **Meas Setup, Bandwidth**

Packet Commands

Packet Access Code and Header

`[:SENSe] :PACKet :ACHeader`

`[:SENSe] :PACKet :ACHeader?`

Set the number of bits which total the Bluetooth packet Access Code and Header.

Factory Preset

and *RST: 126

Range: 0 to 126

Remarks: You must be in the Bluetooth mode to use this command. Use INSTRument:SElect to set the mode.

Front Panel

Access: **Mode Setup, Packet Data...**

Packet Payload CRC Length

`[:SENSe] :PACKet :DH1 | DH3 | DH5Crc <bits>`

`[:SENSe] :PACKet :DH1 | DH3 | DH5Crc?`

Set the number of bits which make up the DH1, DH3, or DH5 payload CRC length. The default value is 16 bits.

Factory Preset

and *RST: DH1 16

DH3 16

DH5 16

Range: DH1 0 to 16

DH3 0 to 16

DH5 0 to 16

Remarks: You must be in the Bluetooth mode to use this command. Use INSTRument:SElect to set the mode.

Front Panel

Access: **Mode Setup, Packet Data...**

Packet Payload Header

[[:SENSE]:PACKet:DH1|DH3|DH5Header <bits>

[[:SENSE]:PACKet:DH1|DH3|DH5Header?

Set the number of bits which make up the DH1, DH3, or DH5 Packet Payload Header.

Factory Preset
and *RST:

DH1	8
DH3	16
DH5	16

Range:

DH1	0 to 8
DH3	0 to 16
DH5	0 to 16

Remarks: You must be in the Bluetooth mode to use this command. Use INSTRument:SElect to set the mode.

Front Panel

Access: **Mode Setup, Packet Data...**

Packet Payload Data Length

[[:SENSE]:PACKet:DH1|DH3|DH5Length <bits>

[[:SENSE]:PACKet:DH1|DH3|DH5Length?

Set the number of data bits which make up the DH1, DH3, or DH5 Payload Data. The default value does not include the 16 CRC bits.

Factory Preset
and *RST:

DH1	216
DH3	1464
DH5	2712

Range:

DH1	0 to 232
DH3	0 to 1480
DH5	0 to 2728

Remarks: You must be in the Bluetooth mode to use this command. Use INSTRument:SElect to set the mode.

Front Panel

Access: **Mode Setup, Packet Data...**

Packet Type

`[:SENSE]:PTYPE DH1|DH3|DH5`

`[:SENSE]:PTYPE?`

Select the type of packet to measure

Factory Preset

and *RST: DH1

Remarks: You must be in the Bluetooth mode to use this command. Use
:INSTrument:SElect to set the mode.

Front Panel

Access: **Frequency Channel, Packet Type**

RF Power Commands

RF Port Input Attenuation

`[:SENSE]:POWER[:RF]:ATTenuation <rel_power>`

`[:SENSE]:POWER[:RF]:ATTenuation?`

Set the RF input attenuator. This value is set at its auto value if RF input is set to auto.

Factory Preset

and *RST: 10 dB for SA

5 dB for Bluetooth, cdmaOne, GSM

Range: ESA E4402B, E4403B: 0 to 75 dB for SA

ESA E4404B: 0 to 75 dB for SA

ESA E4405B: 0 to 75 dB for SA

ESA E4407B, E4408B: 0 to 65dB for SA

0 to 75 dB in 5 dB steps for cdmaOne, GSM

Same range as SA mode, but in 5 dB steps for Bluetooth

Default Unit: dB

Front Panel

Access: **Input, Input Atten** for Bluetooth, cdmaOne, GSM

or

Mode Setup, Input, Tab⇒, Input Attenuation for Bluetooth, cdmaOne, GSM

or

AMPLITUDE/Y Scale, Attenuation for SA, cdmaOne, GSM

RF Input Port Power Gain

```
[ :SENSe ] :POWER [ :RF ] :GAIN [ :STATE ] OFF | ON | 0 | 1
```

```
[ :SENSe ] :POWER [ :RF ] :GAIN [ :STATE ] ?
```

Turns the internal preamp on or off for the currently selected measurement.

Factory Preset

and *RST: OFF

Remarks: You must be in GSM or Bluetooth mode to use this command.
Use INSTRUMENT:SELEct to set the mode.

Front Panel

Access: **AMPLITUDE/Y Scale, Int Preamp for SA**

or

Mode Setup, Input... for GSM, Bluetooth

or

Input, Int Preamp for GSM, Bluetooth

RF Port Power Range

```
[ :SENSe ] :POWER [ :RF ] :RANGE <dBm>
```

```
[ :SENSe ] :POWER [ :RF ] :RANGE ?
```

Set the maximum total power to be applied at the RF input. There are two modes of operation as follows:

When RF Port Power Range Auto = AUTO, Max Total Pwr displays the actual measured power level.

When RF Port Power Range Auto = MANual, the input power range is determined by the manually entered Max Total Pwr value.

Range: -100 to +80

Default Unit: dBm

Remarks: You must be in GSM or Bluetooth mode to use this command.
Use INSTRUMENT:SELEct to set the mode.

Front Panel

Access: **Mode Setup, Input....**

or

Input, Max Total Pwr

RF Port Power Range Auto

[:SENSE] :POWER [:RF] :RANGE :AUTO OFF | ON | 0 | 1

[:SENSE] :POWER [:RF] :RANGE :AUTO?

Select the RF port power range to be set either automatically or manually.

ON - power range is automatically set as determined by the actual measured power level at the start of a measurement, as displayed by the Max Total Pwr value.

OFF - power range is manually set by either the manually entered Max Total Pwr or Input Atten value.

Factory Preset
and *RST: ON

Remarks: You must be in GSM or Bluetooth mode to use this command.
Use INSTRUMENT:SELEct to set the mode.

Front Panel
Access: **Mode Setup, Input....**

or
Input, Max Total Pwr

Radio Standards Commands

Radio Device Under Test

[:SENSE] :RADIo :DEVIce PC1 | PC2 | PC3

[:SENSE] :RADIo :DEVIce?

Select the power class of the Bluetooth device to be measured. Choices are Power Class 1, 2, or 3.

Factory Preset
and *RST: PC1

Remarks: You must be in Bluetooth mode to use this command. Use
INSTRUMENT:SELEct to set the mode.

Global to current mode.

Front Panel
Access: **Mode Setup, Radio, Device**

Synchronization Commands

Burst Search Pre-Trigger

`[:SENSe] :SYNC:BURSt:SPRetrig <seconds>`

`[:SENSe] :SYNC:BURSt:SPRetrig?`

Enter the value, relative to the trigger, that will determine the point where the trace data will start to be collected. Default is $-100\mu\text{s}$.

Factory Preset

and *RST: $-100\ \mu\text{s}$

Range: $-4.000\ \text{ms}$ to $4.000\ \text{ms}$

Remarks: You must be in the Bluetooth mode to use this command. Use INSTRument:SElect to set the mode.

Front Panel

Access: **Mode Setup, Demod....**

or

Det/Demod, Burst Search Pre-Trigger

Burst Search Threshold

`[:SENSe] :SYNC:BURSt:STHReshold <rel_power>`

`[:SENSe] :SYNC:BURSt:STHReshold?`

Set the power threshold, relative to the peak power, that is used to determine the burst rising edge and falling edge.

Factory Preset

and *RST: $-10\ \text{dB}$

$-3.00\ \text{dB}$ for Bluetooth

Range: -200 to $-0.01\ \text{dB}$

-50.00 to $-0.01\ \text{dB}$ for Bluetooth

Default Unit: dB

Remarks: You must be in the Bluetooth or GSM mode to use this command. Use INSTRument:SElect to set the mode.

Front Panel

Access: **Mode Setup, Demod....**

or

Det/Demod, Burst Search Threshold

TRIGger Subsystem

The Trigger Subsystem is used to set the controls and parameters associated with triggering the data acquisitions. Other trigger-related commands are found in the INITiate and ABORt subsystems.

External Trigger Delay

:TRIGger[:SEQuence]:EXTernal:DELAy <time>

:TRIGger[:SEQuence]:EXTernal:DELAy?

Set the trigger delay when using an external trigger. Set the trigger value to zero (0) seconds to turn off the delay.

Factory Preset

and *RST: 0.0 s

Range: -5 ms to +5 ms, for GSM, Bluetooth

Default Unit: seconds

Front Panel

Access: **Mode Setup, Trigger...**

or

Trig, External, Delay

External Trigger Slope

:TRIGger[:SEQuence]:EXTernal:SLOPe NEGative|POSitive

:TRIGger[:SEQuence]:EXTernal:SLOPe?

Sets the trigger slope when using an external trigger input.

In SA mode this command activates the trigger condition that allows the next sweep to start when the external voltage (connected to GATE TRIG/EXT TRIG IN on the rear panel) passes through approximately 1.5 volts. The external trigger signal must be a 0 V to +5 V TTL signal. This function only controls the trigger polarity (for positive or negative-going signals).

Factory Preset

and *RST: Positive

Front Panel

Access: **Mode Setup, Trigger...**

or

Trig, External, Slope

RF Burst Trigger Delay

:TRIGger[:SEquence]:RFBurst:DELay <time>

:TRIGger[:SEquence]:RFBurst:DELay?

Set the trigger delay when using the RF burst trigger.

Factory Preset

and *RST: 0.0 μ s

Range: -5ms to 5ms

Default Unit: seconds

Front Panel

Access: **Mode Setup, Trigger, Tab⇒, RF Burst Delay**

or

Trig

RF Burst Trigger Level

:TRIGger[:SEquence]:RFBurst:LEVel <rel_power>

:TRIGger:RFBurst:LEVel <dB> for GSM mode

:TRIGger[:SEquence]:RFBurst:LEVel?

Set the trigger level when using the RF Burst trigger. The value is relative to the peak of the signal. RF Burst is also known as RF Envelope.

Factory Preset

and *RST: -6.0 dB

Range: -25.0 to 0.0 dB

Default Unit: dB

Front Panel

Access: **Mode Setup, Trigger, Tab⇒, RF Burst Level**

or

Trig, RF Burst, Peak Level

Video Trigger Delay

:TRIGger[:SEQuence]:VIDeo:DELAy <time>

:TRIGger[:SEQuence]:VIDeo:DELAy?

Set the trigger delay when using the video trigger.

Factory Preset

and *RST: 0.000 s

Range: -5.000 to 5.000 ms

Default Unit: seconds

Remarks: You must be in the Bluetooth mode to use this command. Use :INSTrument:SELEct to set the mode.

Front Panel

Access: **Mode Setup, Trigger..., Tab⇒, Video Delay**
Trig, Video

Video Trigger Level Amplitude

:TRIGger[:SEQuence]:VIDeo:LEVel <ampl>

:TRIGger[:SEQuence]:VIDeo:LEVel?

Specifies the level at which a video trigger will occur.

Factory Preset

and *RST: -3.5 dB

Range: -25.00 to 0.00 dB

Default Unit: current amplitude units

Remarks: Video is adjusted using this command, but must also be selected using the command:

:TRIGger[:SEQuence]:SOURce VIDEO

You must be in the Bluetooth mode to use this command. Use :INSTrument:SELEct to set the mode.

Front Panel

Access: **Trig, Video**
Mode Setup, Trigger..., Tab⇒, Video Level

Index

Numerics

1.3 MHz filter

- carrier frequency drift, 55
- initial carrier frequency tolerance, 64
- modulation characteristics, 69
- modulation overview, 83

A

- abort command, 22
- access code and header
 - access code, 95
- adjacent channel power, 50
 - fast mode, 50, 51
 - limit test, 23, 52
 - measurement, 40, 50
- applications, selecting, 35, 36
- attenuation
 - setting, 97
- average count
 - carrier frequency drift, 53
 - initial carrier frequency tolerance, 62
 - modulation characteristics, 66
 - modulation overview, 81
 - output power, 85
 - output spectrum bandwidth, 90
- average state
 - carrier frequency drift, 53
 - initial carrier frequency tolerance, 62
 - modulation characteristics, 66
 - modulation overview, 82
 - output power, 85
 - output spectrum bandwidth, 90
- average type
 - output power, 87
- averaging
 - ACP, 51
 - ACPR, 51
 - carrier frequency drift, 54
 - initial carrier frequency tolerance, 63
 - modulation characteristics, 67
 - modulation overview, 82
 - monitor band/channel, 72, 73, 75, 79
 - output power, 85
 - output spectrum bandwidth, 91

B

- bandwidth
 - modulation characteristics, 68
 - monitor band/channel, 74, 78
 - output spectrum bandwidth, 94
- bandwidth resolution
 - monitor band/channel - band method, 74
- output spectrum bandwidth, 91

Bluetooth measurement, 40, 41, 42, 43, 46, 47

- burst search pre-trigger, 100
- burst search threshold, 100
- burst sync source
 - carrier frequency drift, 54
 - initial carrier frequency tolerance, 63
 - modulation characteristics, 69
 - modulation overview, 83
 - output power, 87
- burst trigger
 - level, 102

C

- carrier frequency drift
 - 1.3 MHz filter, 55
 - average count, 53
 - average state, 53
 - averaging termination control, 54
 - burst sync source, 54
 - limit commands, 24
 - limit test, 55
 - lower limit, 24
 - maximum drift rate limit
 - lower, 25
 - upper, 25
 - measurement, 41, 53
 - post-detection filter, 55
 - trigger source, 56
 - upper limit, 24
 - view offset, 56
- center frequency setting, 60
- changing
 - instrument settings, 50
- channel
 - search, 60
- channel number, setting, 57, 58
- channel span
 - monitor band/channel, 77
- commands, 95
- continuous vs. single measurement mode, 33
- control measurement commands, 33
- correction for external gain, 58, 59
- CRC length packet, 95

D

- data from measurements, 37
- default values for measurements, 38
- defaults, 59
- delay
 - video trigger, 103
- detector
 - monitor band/channel, 75, 79
- deviation, 59
- disk drive commands, 48

E

- external gain
 - correction, 58, 59
- external trigger
 - delay, 101
 - slope, 101

F

- fast ACP
 - adjacent channel power, 50, 51
- filter
 - carrier frequency drift, 55
 - initial carrier frequency tolerance, 64
 - modulation characteristics, 69
 - modulation overview, 83
- frequency
 - center, 60
 - hopping, 57, 60

G

- GSM Mode defaults, 59

H

- hold result
 - modulation characteristics, 70
- hopping, 57, 60

I

- initial carrier frequency tolerance
 - 1.3 MHz filter, 64
 - average count, 62
 - average state, 62
 - averaging termination control, 63
 - burst sync source, 63
 - limit commands, 26
 - limit test, 64
 - lower limit, 26
 - measurement, 42, 62
 - post-detection filter, 64
 - trigger source, 65
 - upper limit, 26
- initiate measurement, 33
- input attenuation, 97
- input power
 - range, 98, 99
- instrument configuration, 35

L

- limit line testing, 25
- limit test
 - adjacent channel power, 23, 52
 - Bluetooth, 23
 - carrier frequency drift, 55
 - initial carrier frequency tolerance, 64
 - modulation characteristics, 70

Index

- output power, 88
 - output spectrum bandwidth, 92
 - limits
 - carrier frequency drift, 24
 - initial carrier frequency tolerance, 26
 - modulation characteristics, 27
 - output power, 28
 - output spectrum bandwidth, 30
 - M**
 - mass storage commands, 48
 - maximum deviation, 59
 - maximum hold
 - output spectrum bandwidth, 93
 - measurement modes
 - selecting, 35, 36
 - measurements, 50
 - adjacent channel power, 40, 50
 - carrier frequency drift, 41, 53
 - configuration, 37
 - control of, 33
 - getting results, 37
 - initial carrier frequency tolerance, 42, 62
 - modulation characteristics, 43, 66
 - modulation overview, 45, 81
 - monitor band/channel, 44, 72
 - output power, 46, 84
 - output spectrum bandwidth, 47, 90
 - single/continuous, 33
 - memory commands, 48
 - method
 - monitor band/channel, 81
 - modulation characteristics
 - 1.3 MHz filter, 69
 - average count, 66
 - average lower limit, 27
 - average state, 66
 - average upper limit, 27
 - averaging termination control, 67
 - burst sync source, 69
 - hold result, 70
 - limit commands, 27
 - limit test, 70
 - measurement, 43, 66
 - payload data, 71
 - post-detection filter, 69
 - ratio lower limit, 27
 - resolution bandwidth, 68
 - result, 70
 - trigger source, 71
 - modulation overview
 - 1.3 MHz filter, 83
 - average count, 81
 - average state, 82
 - averaging termination control, 82
 - burst sync source, 83
 - measurement, 45, 81
 - post-detection filter, 83
 - trigger source, 84
 - view offset, 84
 - monitor band/channel
 - average count, 72
 - averaging state, 72
 - averaging termination control, 73
 - band method
 - detector mode, 75
 - maximum hold trace, 75
 - video bandwidth, 74
 - band sweep time, 76
 - band sweep time auto, 77
 - channel method
 - detector mode, 79
 - maximum hold trace average state, 79
 - resolution bandwidth, 78
 - video bandwidth, 78
 - channel span, 77
 - channel sweep time, 80
 - channel sweep time auto, 80
 - measurement, 44, 72
 - method selection, 81
 - O**
 - output power
 - average count, 85
 - average state, 85
 - average type, 87
 - averaging termination control, 85
 - burst sync source, 87
 - limit commands, 28
 - limit test, 88
 - lower average limit, 29
 - measurement, 46, 84
 - start marker, 88
 - stop marker, 89
 - trigger source, 89
 - upper average limit, 28
 - upper peak limit, 29
 - output spectrum bandwidth
 - average count, 90
 - average state, 90
 - averaging termination control, 91
 - bandwidth resolution, 91
 - limit commands, 30
 - limit test, 92
 - maximum hold, 93
 - measurement, 47, 90
 - setting the bandwidth, 94
 - span, 92
 - sweep time, 93
 - sweep time auto, 94
 - upper limit, 30
 - video bandwidth, 92
 - P**
 - packet, 95, 96
 - CRC length, 95
 - header, 95
 - type, 97
 - pass/fail test, 25
 - pause
 - restart, 34
 - pause measurement, 34
 - payload
 - data
 - data length, 96
 - modulation characteristics, 71
 - header, 96
 - personalities
 - selecting, 35, 36
 - post-detection filter
 - carrier frequency drift, 55
 - initial carrier frequency tolerance, 64
 - modulation characteristics, 69
 - modulation overview, 83
 - power
 - class, 99
 - threshold setting, 100
 - pre-amplifier
 - on/off, 98
 - pre-trigger
 - setting, 100
 - Q**
 - quit command, 22
 - R**
 - radio device, 99
 - rear panel external trigger
 - delay, 101
 - slope, 101
 - resolution bandwidth
 - modulation characteristics, 68
 - monitor band/channel - band method, 74
 - restart measurement, 34
 - results from measurements, 37
 - resume measurement, 34
 - RF port power
 - gain, 98
 - range, 98
 - auto, 99
 - S**
 - saving traces, 48
 - SENSe defaults, 59
 - setting default values, 38
 - single vs. continuous measurement
 - mode, 33
 - span
-

Index

MONitor channel/band, [76](#)
output spectrum bandwidth, [92](#)
start marker
output power, [88](#)
start measurement, [33](#), [34](#)
state
changing, [50](#)
stop command, [22](#)
stop marker
output power, [89](#)
storing
traces, [48](#)
sweep time
See also Post-detection Filter
sweep time
monitor band/channel, [76](#), [80](#)
output spectrum bandwidth, [93](#)
synchronization, [100](#)

T
test limits, [25](#)
carrier frequency drift, [24](#), [25](#)
initial carrier frequency tolerance, [26](#)
modulation characteristics, [27](#)
output power, [28](#), [29](#)
output spectrum bandwidth, [30](#)
traces
storing, [48](#)
trigger
burst level, [102](#)
commands, [101](#)
delay, [101](#)
external, [101](#)
slope, [101](#)
video, level, [103](#)
trigger measurement, [33](#)
trigger source

carrier frequency drift, [56](#)
initial carrier frequency tolerance, [65](#)
modulation characteristics, [71](#)
modulation overview, [84](#)
output power, [89](#)

V
video bandwidth
output spectrum bandwidth, [92](#)
video trigger
delay, [103](#)
level, [103](#)
view offset
carrier frequency drift, [56](#)
modulation overview, [84](#)