# VIAVI

## 3900 Series

**Digital Radio Test Set**

dPMR Remote Programming Manual

# 3900 Series

# Digital Radio Test Set

# dPMR Remote Programming Manual

Re-Issued          Jan 2020

# Preface

## ABOUT THIS MANUAL

This manual identifies Remote Commands for the 3900 Series dPMR Option (390XOPT420). Refer to the 3900 Series Remote Programming Manual for additional information about 3900 Remote Commands and for remote commands for 3900 Test Instruments. The remote commands identified in this manual are only valid when the dPMR Option is installed in the Test Set. Refer to the 3900 Series Operation Manual for information pertaining to Test Set operation.

## NOMENCLATURE STATEMENT

The 3901, 3902 and 3920"x" Digital Radio Test Set is the official nomenclature for the test sets currently included in the 3900 Digital Radio Test Set Series. In this manual, 3900, unit or Test Set, refers to the 3901, 3902 and 3920"x" Digital Radio Test Sets unless otherwise indicated.

## INTENDED AUDIENCE

This manual is intended for personnel familiar with the use of remote command language and Test Set operation. Refer to the 3900 Series Operation Manual for information pertaining to Test Set operation.

## TEST SET REQUIREMENTS

Refer to the 3900 Series Operation Manual for information on the following:

- Safety Precautions
- Power Requirements
- Platform Performance Data Specifications
- Repacking / Shipping Test Set

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# Chapter 1 - UUT Measurement Return Data

## 1.1 INTRODUCTION

This chapter contains general information about dPMR UUT Measurement return data. Refer to the 3900 Series Digital Radio Test Set Remote Programming Manual for detailed information about 3900 system remote commands.

| NOTE | Upper range value of 2.71 GHz is only valid for some 3900 models/options. Refer to product specifications for valid upper range. |
|------|---|

## 1.2 UUT MEASUREMENT RETURN VALUES

The information returned in UUT Measurement Meters data strings varies depending on the type of measurement. The following are examples:

 <statusbyte>,<failbyte>,<avgcount>,<avg>,<wc>

<statusbyte>,<failbyte>,<precision>,<percentage>,<avg>,<max>,<min>,<units>

<statusbyte>, <failbyte>, <avgcount>, <avg>, <max>, <min>

### 1.2.1 Status Byte (Bitmask)

| NOTE | Statusbyte may return more than one condition as a bitmask. |
|------|---|

Status Byte returned in the following bit position indicates measurement reading status:

      Bit 0 = Invalid

      Bit 1 = Inaccurate

      Bit 2 = Settling

      Bit 3 = Squelch

      Returns 0 when measurement reading is valid.

### 1.2.2 Fail Byte (Bitmask)

| NOTE | Failbyte may return more than one condition as a bitmask. |
|------|---|

Returns 0 in the following bit position when limit check has passed.

Returns 1 in the following bit position when limit check has failed.

      Bit 0 = Minimum Upper Limit

      Bit 1 = Minimum Lower Limit

      Bit 2 = Maximum Upper Limit

      Bit 3 = Maximum Lower Limit

      Bit 4 = Average Upper Limit

      Bit 5 = Average Lower Limit

      Bit 6 = Worst Case Upper Limit

      Bit 7 = Worst Case Lower Limit

### 1.2.3     Precision (Numeric)

Precision value indicates the number of numerals that follow the decimal point in the returned average, maximum and minimum readings.

### 1.2.4     Percentage (Numeric)

Percentage value indicates the percentage of averaging completed when remote command was issued. For example, if the over *n* burst field is set to 1000 bursts, and only 500 bursts have been obtained when the query command is issued, the returned percentage value is 50.

### 1.2.5     Average (Numeric)

Value indicates average measurement reading.

### 1.2.6     Maximum (Numeric)

Value indicates maximum measurement reading.

### 1.2.7     Minimum (Numeric)

Value indicates minimum measurement reading.

### 1.2.8     Worst Case (wc)

Value indicates maximum measurement reading.

### 1.2.9     Peak to Peak/2 (pk-pk/2)

Value indicates FM Peak to Peak/2 measurement reading.

### 1.2.10     Positive Peak (pospeak)

Value indicates maximum measurement reading.

### 1.2.11     Negative Peak (negpeak)

Value indicates minimum measurement reading.

### 1.2.12     Units

| | | |
|---|---|---|
| 0 = No Units | 7 = V | 14 = dBW |
| 1 = % | 8 = mV | 15 = Vrms |
| 2 = Hz | 9 = µV | 16 = dBr |
| 3 = kHz | 10 = dBµV | 17 = dBV |
| 4 = MHz | 11 = W | 18 = mHz |
| 5 = dB | 12 = mW | 19 = µs |
| 6 = dBm | 13 = µW | |

### 1.2.13     Message Responses

A message response is not always included at the end of the data string. The following are valid Message Responses which may be received when a remote command is sent.

"signal not acquired\n"

"timed out waiting for TraceMutex\n"

"timed out waiting for data\n"

# Chapter 2 - Generator/Transmit Channel Remote Commands

## 2.1 INTRODUCTION

This chapter describes the Remote Commands for configuring dPMR Generator and Transmit Channel Parameters. Commands are listed alphabetically under headings.

## 2.2 AF GENERATOR CONFIGURATION

### 2.2.1 AF Generators - Enable

**:AF:GENerator:SOURceN:ENABle**
**:AF:GENerator:SOURceN:ENABle?**

| | |
|---|---|
| **Description:** | Set command Enables/Disables the specified AF Generator. |
| | Query command returns parameter setting. |
| **Parameter:** | OFF \| ON \| 0 \| 1 |
| **Default Value:** | OFF |
| **Set/Query Format:** | Boolean |
| **Example:** | :AF:GENerator:SOURce2:ENABle ON |
| | Enables AF Generator 2. |
| **Query Response:** | :AF:GENerator:SOURce2:ENABle? |
| | 1 |

> **NOTE** SourceN = 1, 2 or 3 (AF Generator 1, 2 or 3)

### 2.2.2 AF Generators - Frequency

**:AF:GENerator:SOURceN:FREQuency**
**:AF:GENerator:SOURceN:FREQuency?**

| | |
|---|---|
| **Description:** | Set command defines the frequency for the specified AF Generator. |
| | Query command returns parameter setting. |
| **Range:** | 1.0 Hz to 40.0 kHz |
| **Units:** | Hz \| kHz |
| **Default Value:** | AF 1: 1.0 kHz |
| | AF 2: 300.0 Hz |
| | AF 3: 3.4 kHz |
| **Set/Query Format:** | NRf \| NR2 (Hz) |
| **Example:** | :AF:GENerator:SOURce3:FREQuency 15kHz |
| | Sets AF Generator 3 Frequency to 15.0 kHz. |
| **Query Response:** | :AF:GENerator:SOURce3:FREQuency? |
| | 15000.0 |

> **NOTE** SourceN = 1, 2 or 3 (AF Generator 1, 2 or 3)

### 2.2.3      AF Generators - Impedance

**:CONFigure:IMPedance:AF:GENerator**
**:CONFigure:IMPedance:AF:GENerator?**

|  |  |
|---|---|
| **Description:** | Set command defines the Impedance of the AF Generator. |
|  | Query command returns parameter setting. |
| **Range:** | 1 to 10,000 Ohms |
| **Units:** | Ohms |
| **Default Value:** | 600 Ohms |
| **Set/Query Format:** | NRf \| NR1 |
| **Example:** | :CONFigure:IMPedance:AF:GENerator 500OHMS |
|  | Sets AF Generator Impedance to 500 Ohms. |
| **Query Response:** | :CONFigure:IMPedance:AF:GENerator? |
|  | 500 |

### 2.2.4      AF Generators - Level

**:AF:GENerator:SOURceN:LEVel**
**:AF:GENerator:SOURceN:LEVel?**

|  |  |
|---|---|
| **Description:** | Set command defines the Level for the specified AF Generator. |
|  | Query command returns parameter setting. |
| **Range:** | 1.0 mV to 5.0 Vrms |
| **Units:** | mV \| V |
| **Default Value:** | 100.0 mV |
| **Set/Query Format:** | NRf \| NR2 (mV) |
| **Example:** | :AF:GENerator:SOURce1:LEVel 5V |
|  | Sets AF Generator 1 Level (Amplitude) to 5.0 V. |
| **Query Response:** | :AF:GENerator:SOURce1:LEVel? |
|  | 5000.0 |

| NOTE | SourceN = 1, 2 or 3 (AF Generator 1, 2 or 3) |
|---|---|

## 2.2.5 AF Generators - Waveform

**:AF:GENerator:SOURceN:SHAPe**
**:AF:GENerator:SOURceN:SHAPe?**

| | |
|---|---|
| **Description:** | Set command defines the Waveform for the specified AF Generator. |
| | Query command returns parameter setting. |
| **Parameter:** | SINE \| SQUare \| TRIangle \| RAMP \| DCS \| DCSINV \| DTMF |
| **Query Data:** | SNR \| SINE \| SQUare \| TRIangle \| RAMP \| DCS \| DCSINV \| DTMF \| TONESEQ \| TONEREM |
| **Default Value:** | SINE |
| **Set/Query Format:** | CPD \| CRD |
| **Example:** | :AF:GENerator:SOURce2:SHAPe SQUare |
| | Sets AF Generator 2 Waveform shape to Square. |
| **Query Response:** | :AF:GENerator:SOURce2:SHAPe? |
| | SQU |

NOTE

SourceN = 1, 2 or 3 (AF Generator 1, 2 or 3)

DTMF waveform is only valid on AF Generator 1.  AF Generator 2 is unavailable when DTMF is selected on AF Generator 1.

DCS and DCSINV are not supported on AF Generator 3.

AF Generator 1 is unavailable as a modulation source when Normal MOD SNR Noise Measurements are defined (:CONFigure:MOD:ANALyzer:SNR:MODE 1) and AF:GENerator:SOURce1:SHAPe? returns SNR.

## 2.3      AF GENERATOR - TONE ENCODING

### 2.3.1      AF Generators - Encoding Enable

**:AF:GENerator:ENCODE:ENABle**
**:AF:GENerator:ENCODE:ENABle?**

| | |
|---|---|
| **Description:** | Set command Enables/Disables (sends) one Tone. |
| | Query command returns parameter setting. |
| **Parameter:** | OFF \| ON \| 0 \| 1 |
| **Default Value:** | OFF |
| **Set/Query Format:** | Boolean |
| **Example:** | :AF:GENerator:ENCODE:ENABle ON |
| | Sends one Tone from Audio Generator. |
| **Query Response:** | :AF:GENerator:ENCODE:ENABle? |
| | 1 |

### 2.3.2      AF Generators - Encoded Signal Type

**:AF:GENerator:ENCODE:TYPE**
**:AF:GENerator:ENCODE:TYPE?**

| | |
|---|---|
| **Description:** | Set command defines type of signal being Encoded by the AF Generator. |
| | Query command returns parameter setting. |
| **Parameter:** | TWOTONE \| TONESEQ \| TONEREM |
| **Default:** | TWOTONE |
| **Set/Query Format:** | CPD \| CRD |
| **Example:** | :AF:GENerator:ENCODE:TYPE TWOTONE |
| | Sets Audio Generator Tone Signaling Type to Two Tone Sequential. |
| **Query Response:** | :AF:GENerator:ENCODE:TYPE? |
| | TWOTONE |

### 2.3.3      AF Generators - Tone Remote Function Duration

**:AF:GEN:TONE:REMote:FUNCtion:DURation**
**:AF:GEN:TONE:REMote:FUNCtion:DURation?**

| | |
|---|---|
| **Description:** | Set command defines length of single Tone. |
| | Query command returns parameter setting. |
| **Range:** | 20 to 500 ms |
| **Units:** | ms \| s |
| **Default:** | 40 ms |
| **Set/Query Format:** | NRf \| NR1 (ms) |
| **Example:** | :AF:GEN:TONE:REMote:FUNCtion:DURation 50ms |
| | Sets length of single Tone to 50 milliseconds. |
| **Query Response:** | :AF:GEN:TONE:REMote:FUNCtion:DURation? |
| | 50 |

### 2.3.4          AF Generators - Tone Remote Function Frequency

**:AF:GEN:TONE:REMote:FUNCtion:FREQuency**
**:AF:GEN:TONE:REMote:FUNCtion:FREQuency?**

| | |
|---:|:---|
| **Description:** | Set command defines the Tone frequency. |
| | Query command returns parameter setting. |
| **Range:** | 1.0 Hz to 2.999 kHz |
| **Units:** | Hz \| kHz |
| **Default Value:** | 1.050 kHz |
| **Set/Query Format:** | NRf \| NR2 (Hz) |
| **Example:** | :AF:GEN:TONE:REMote:FUNCtion:FREQuency 15Hz |
| | Sets Tone Frequency to 15.0 Hz. |
| **Query Response:** | :AF:GEN:TONE:REMote:FUNCtion:FREQuency? |
| | 15.0 |

### 2.3.5          AF Generators - Tone Remote Function Level

**:AF:GEN:TONE:REMote:FUNCtion:LEVel**
**:AF:GEN:TONE:REMote:FUNCtion:LEVel?**

| | |
|---:|:---|
| **Description:** | Set command defines the Tone Audio Level. |
| | Query command returns parameter setting. |
| **Range:** | -20.0 to +20.0 dB |
| **Units:** | dB |
| **Default Value:** | 0.0 dB |
| **Set/Query Format:** | NRf \| NR2 |
| **Example:** | :AF:GEN:TONE:REMote:FUNCtion:LEVel 5dB |
| | Sets the Tone Audio Level to 5.0 dB. |
| **Query Response:** | :AF:GEN:TONE:REMote:FUNCtion:LEVel? |
| | 5.0 |

### 2.3.6          AF Generators - Tone Remote Guard Duration

**:AF:GEN:TONE:REMote:GUARD:DURation**
**:AF:GEN:TONE:REMote:GUARD:DURation?**

| | |
|---:|:---|
| **Description:** | Set command defines length of single Tone. |
| | Query command returns parameter setting. |
| **Range:** | 1 to 6,000,000 ms |
| **Units:** | ms \| s \| ks |
| **Default:** | 120 ms |
| **Set/Query Format:** | NRf \| NR1 (ms) |
| **Example:** | :AF:GEN:TONE:REMote:GUARD:DURation 50ms |
| | Sets length of single Tone 50 milliseconds. |
| **Query Response:** | :AF:GEN:TONE:REMote:GUARD:DURation? |
| | 50 |

### 2.3.7    AF Generators - Tone Remote Guard Frequency

**:AF:GEN:TONE:REMote:GUARD:FREQuency**
**:AF:GEN:TONE:REMote:GUARD:FREQuency?**

| | |
|---|---|
| **Description:** | Set command defines the Tone frequency. |
| | Query command returns parameter setting. |
| **Range:** | 1.0 Hz to 2.999 kHz |
| **Units:** | Hz \| kHz |
| **Default Value:** | 2.175 kHz |
| **Set/Query Format:** | NRf \| NR2 (Hz) |
| **Example:** | :AF:GEN:TONE:REMote:GUARD:FREQuency 15Hz |
| | Sets Tone Frequency to 15.0 Hz. |
| **Query Response:** | :AF:GEN:TONE:REMote:GUARD:FREQuency? |
| | 15.0 |

### 2.3.8    AF Generators - Tone Remote Guard Level

**:AF:GEN:TONE:REMote:GUARD:LEVel**
**:AF:GEN:TONE:REMote:GUARD:LEVel?**

| | |
|---|---|
| **Description:** | Set command defines the Tone Audio Level. |
| | Query command returns parameter setting. |
| **Range:** | -20.0 to +20.0 dB |
| **Units:** | dB |
| **Default Value:** | -20.0 dB |
| **Set/Query Format:** | NRf \| NR2 |
| **Example:** | :AF:GEN:TONE:REMote:GUARD:LEVel 5dB |
| | Sets the Tone Audio Level to 5.0 dB. |
| **Query Response:** | :AF:GEN:TONE:REMote:GUARD:LEVel? |
| | 5.0 |

### 2.3.9    AF Generators - Tone Remote Maximum Duration

**:AF:GEN:TONE:REMote:MAXimum:DURation**
**:AF:GEN:TONE:REMote:MAXimum:DURation?**

| | |
|---|---|
| **Description:** | Set command defines length of single Tone. |
| | Query command returns parameter setting. |
| **Range:** | 20 to 500 ms |
| **Units:** | ms \| s |
| **Default:** | 120 ms |
| **Set/Query Format:** | NRf \| NR1 (ms) |
| **Example:** | :AF:GEN:TONE:REMote:MAXimum:DURation 50ms |
| | Sets length of single Tone to 50 milliseconds. |
| **Query Response:** | :AF:GEN:TONE:REMote:MAXimum:DURation? |
| | 50 |

### 2.3.10        AF Generators - Tone Remote Maximum Frequency

**:AF:GEN:TONE:REMote:MAXimum:FREQuency**
**:AF:GEN:TONE:REMote:MAXimum:FREQuency?**

|  |  |
|---|---|
| **Description:** | Set command defines the Tone frequency. |
|  | Query command returns parameter setting. |
| **Range:** | 1.0 Hz to 2.999 kHz |
| **Units:** | Hz \| kHz |
| **Default Value:** | 2.175 kHz |
| **Set/Query Format:** | NRf \| NR2 (Hz) |
| **Example:** | :AF:GEN:TONE:REMote:MAXimum:FREQuency 15Hz |
|  | Sets Tone Frequency to 15.0 Hz. |
| **Query Response:** | :AF:GEN:TONE:REMote:MAXimum:FREQuency? |
|  | 15.0 |

### 2.3.11        AF Generators - Tone Remote Maximum Level

**:AF:GEN:TONE:REMote:MAXimum:LEVel**
**:AF:GEN:TONE:REMote:MAXimum:LEVel?**

|  |  |
|---|---|
| **Description:** | Set command defines the Tone Audio Level. |
|  | Query command returns parameter setting. |
| **Range:** | -20.0 to +20.0 dB |
| **Units:** | dB |
| **Default Value:** | 10.0 dB |
| **Set/Query Format:** | NRf \| NR2 |
| **Example:** | :AF:GEN:TONE:REMote:MAXimum:LEVel 5dB |
|  | Sets the Tone Audio Level to 5.0 dB. |
| **Query Response:** | :AF:GEN:TONE:REMote:MAXimum:LEVel? |
|  | 5.0 |

### 2.3.12        AF Generators - Tone Remote Reference Level

**:AF:GEN:TONE:REMote:REFerence:LEVel**
**:AF:GEN:TONE:REMote:REFerence:LEVel?**

|  |  |
|---|---|
| **Description:** | Set command defines the Tone Reference Audio Level. |
|  | Query command returns parameter setting. |
| **Range:** | 20.0 to 5000.0 mV |
| **Units:** | mV \| V |
| **Default Value:** | 1.0 V |
| **Set/Query Format:** | NRf \| NR2 (mV) |
| **Example:** | :AF:GEN:TONE:REMote:REFerence:LEVel 2.5V |
|  | Sets the Tone Reference Audio Level to 2.5 Volts. |
| **Query Response:** | :AF:GEN:TONE:REMote:REFerence:LEVel? |
|  | 2500 |

### 2.3.13        AF Generators - Tone Sequential Audio Level

**:AF:GEN:TONE:SEQuential:MASTER:LEVel**
**:AF:GEN:TONE:SEQuential:MASTER:LEVel?**

|  |  |
|---|---|
| **Description:** | Set command defines the Audio Level for Tone Sequential tones. |
| | Query command returns parameter setting. |
| **Range:** | 20.0 to 5000.0 mV |
| **Units:** | mV \| V |
| **Default Value:** | 1.0 V |
| **Set/Query Format:** | NRf \| NR2 (mV) |
| **Example:** | :AF:GEN:TONE:SEQuential:MASTER:LEVel 2V |
| | Sets the Audio Level for Tone Sequential tones to 2.0 Volts. |
| **Query Response:** | :AF:GEN:TONE:SEQuential:MASTER:LEVel? |
| | 2000.0 |

### 2.3.14        AF Generators - Tone Sequential Mode

**:AF:GEN:TONE:SEQuential:MODE**
**:AF:GEN:TONE:SEQuential:MODE?**

|  |  |
|---|---|
| **Description:** | Set command selects Tone Mode of operation. |
| | Query command returns parameter setting. |
| **Parameter:** | SINGLE \| CONTINUOUS |
| **Default Value:** | SINGLE |
| **Set/Query Format:** | CPD \| CRD |
| **Example:** | :AF:GEN:TONE:SEQuential:MODE CONTINUOUS |
| | Sets Mode of Tone Sequential burst to Continuous. |
| **Query Response:** | :AF:GEN:TONE:SEQuential:MODE? |
| | CONTINUOUS |

### 2.3.15        AF Generators - Tone Sequential Protocol

**:AF:GEN:TONE:SEQuential:PROTocol**
**:AF:GEN:TONE:SEQuential:PROTocol?**

|  |  |
|---|---|
| **Description:** | Set command selects protocol of single tone. |
| | Query command returns parameter setting. |
| **Parameter:** | ZVEI1 \| ZVEI2 \| ZVEI3 \| PZVEI \| DZVEI \| PDZVEI \| CCIR1 \| CCIR2 \| PCCIR \| EEA \| EUROSIG \| NATEL \| EIA \| MODAT |
| **Default Value:** | ZVEI1 |
| **Set/Query Format:** | CPD \| CRD |
| **Example:** | :AF:GEN:TONE:SEQuential:PROTocol PZVEI |
| | Sets Protocol for tone to PZVEI. |
| **Query Response:** | :AF:GEN:TONE:SEQuential:PROTocol? |
| | PZVEI |

### 2.3.16          AF Generators - Tone Sequential Sequence

**:AF:GEN:TONE:SEQuential:SEQuence**
**:AF:GEN:TONE:SEQuential:SEQuence?**

| | |
|---|---|
| **Description:** | Set command defines Sequence of single tone. |
| | Query command returns parameter setting. |
| **Parameter:** | 0 \| 1 \| 2 \| 3 \| 4 \| 5 \| 6 \| 7 \| 8 \| 9 \| A \| B \| C \| D \| E \| F |
| | maximum of 8 characters encased in double quotes " " |
| **Default Value:** | 01234 |
| **Set/Query Format:** | hex string |
| **Example:** | :AF:GEN:TONE:SEQuential:SEQuence "ABCD1245" |
| | Sets Tone Sequential Sequence to ABCD1245. |
| **Query Response:** | :AF:GEN:TONE:SEQuential:SEQuence? |
| | ABCD1245 |

### 2.3.17          AF Generators - Two Tone Sequential Duration

**:AF:GENerator:TTS:nTONE:DURation**
**:AF:GENerator:TTS:nTONE:DURation?**

| | |
|---|---|
| **Description:** | Set command defines length of single specified Tone. |
| | Query command returns parameter setting. |
| **Range:** | 100 ms to 10 s |
| **Units:** | ms \| s |
| **Default:** | 1.0 s |
| **Set/Query Format:** | NRf \| NR1 (ms) |
| **Example:** | :AF:GENerator:TTS:ATONE:DURation 5s |
| | Sets length of single Tone A burst to 5 seconds. |
| **Query Response:** | :AF:GENerator:TTS:ATONE:DURation? |
| | 5000 |

NOTE  nTone = A or B (Tone A or B)

### 2.3.18          AF Generators - Two Tone Sequential Frequency

**:AF:GENerator:TTS:nTONE:FREQuency**
**:AF:GENerator:TTS:nTONE:FREQuency?**

| | |
|---|---|
| **Description:** | Set command defines AF Generator Frequency for specified Tone. |
| | Query command returns parameter setting. |
| **Range:** | 1.0 Hz to 2.999 kHz |
| **Units:** | Hz \| kHz |
| **Default Value:** | Tone A: 500.0 Hz |
| | Tone B: 1.0 kHz |
| **Set/Query Format:** | NRf \| NR2 (Hz) |
| **Example:** | :AF:GENerator:TTS:ATONE:FREQuency 150Hz |
| | Sets AF Generator Frequency for Tone A to 150.0 Hz. |
| **Query Response:** | :AF:GENerator:TTS:ATONE:FREQuency? |
| | 150.00 |

NOTE  nTone = A or B (Tone A or B)

## 2.3.19    AF Generators - Two Tone Sequential Level

**:AF:GENerator:TTS:LEVel**
**:AF:GENerator:TTS:LEVel?**

| | |
|---:|---|
| **Description:** | Set command defines the Level for single tone. |
| | Query command returns parameter setting. |
| **Range:** | 20.0 mV to 5.0 Vrms |
| **Units:** | mV \| V |
| **Default Value:** | 1.0 V |
| **Set/Query Format:** | NRf \| NR2 (mV) |
| **Example:** | :AF:GENerator:TTS:LEVel 3V |
| | Sets AF Generator Level (Amplitude) to 3.0 Volts. |
| **Query Response:** | :AF:GENerator:TTS:LEVel? |
| | 3000.0 |

## 2.4　　　DPMR ENCODE PARAMETERS

### 2.4.1　　　Encode - Called ID

**:TRANsmit:CH1:CALLid**
**:TRANsmit:CH1:CALLid?**

| | |
|---|---|
| **Description:** | Set command defines the Called ID encoded in the Transmit Channel. Query command returns parameter setting. |
| **Parameter:** | valid parameter depends on character position |
| **position 1-3:** | 0 through 9 |
| **position 4-7:** | 0 through 9 and * |
| **Default Value:** | 0000001 |
| **Format:** | quoted string, 7 character max, parameters with less than 7 characters are right justified and preceded with 0's (i.e., "8910" is interpreted as "0008910"). |
| **Example:** | :TRANsmit:CH1:CALLid "567" Sets Call ID for Transmit Channel to 0000567. |
| **Query Response:** | :TRANsmit:CH1:CALLid? 0000567 |

### 2.4.2　　　Encode - Channel Code

**:TRANsmit:CH1:CHANnel:CODE**
**:TRANsmit:CH1:CHANnel:CODE?**

| | |
|---|---|
| **Description:** | Set command defines the Channel Code encoded in the Transmit Channel. Query command returns parameter setting. |
| **Range:** | 0 to 63 |
| **Default Value:** | 48 |
| **Set Format:** | binary: value begins with #b (#b110000) octal: value begins with #q (#q60) decimal: value is entered as a decimal value (48) hex: value begins with #h (#h30) |
| **Query Format:** | binary: query command ends with b octal: query command ends with q decimal: default format hex: query command ends with h |
| **Example:** | :TRANsmit:CH1:CHANnel:CODE #h30 Sets Channel Code for Transmit Channel to 48 in hex format. |
| **Query Response:** | :TRANsmit:CH1:CHANnel:CODE? 48 |

### 2.4.3 Encode - Communication Format

**:TRANsmit:CH1:COMMs:FORMat**
**:TRANsmit:CH1:COMMs:FORMat?**

| | |
|---|---|
| **Description:** | Set command defines the Communication Format encoded in the Transmit Channel. |
| | Query command returns parameter setting. |
| **Parameter:** | 0 to 3 |
| **where:** | 0 = Call All (Broadcast) |
| | 1 = Peer to Peer Communication (MS to MS) |
| | 2 = Reserved |
| | 3 = Reserved |
| **Default Value:** | 1 |
| **Set Format:** | binary: value begins with #b (#b11) |
| | octal: value begins with #q (#q1) |
| | decimal: value is entered as a decimal value (1) |
| | hex: value begins with #h (#h1) |
| **Query Format:** | binary: query command ends with b |
| | octal: query command ends with q |
| | decimal: default format |
| | hex: query command ends with h |
| **Example:** | :TRANsmit:CH1:COMMs:FORMat #b11 |
| | Sets Transmit Channel Communication Format to 3 in binary format |
| **Query Response:** | :TRANsmit:CH1:COMMs:FORMat? |
| | 3 |

### 2.4.4 Encode - Emergency Priority

**:TRANsmit:CH1:EMERgency:PRIority**
**:TRANsmit:CH1:EMERgency:PRIority?**

| | |
|---|---|
| **Description:** | Set command defines the Emergency Priority setting encoded in the Transmit Channel. |
| | Query command returns parameter setting. |
| **Parameter:** | 0 \| 1 |
| **where:** | 0 = Normal Priority |
| | 1 = Emergency Priority |
| **Default Value:** | 1 |
| **Set/Query Format:** | decimal |
| **Example:** | :TRANsmit:CH1:EMERgency:PRIority 0 |
| | Sets Transmit Channel Emergency Priority setting to 0. |
| **Query Response:** | :TRANsmit:CH1:EMERgency:PRIority? |
| | 0 |

## 2.4.5      Encode - Unit Identifier

**:TRANsmit:CH1:UNITid**
**:TRANsmit:CH1:UNITid?**

|  |  |
|---|---|
| **Description:** | Set command defines the Unit Identifier encoded in the Transmit Channel. |
| | Query command returns parameter setting. |
| **Parameter:** | valid parameter depends on character position |
| **char 1-3:** | 0 through 9 |
| **char 4-7:** | 0 through 9 and * |
| **Default Value:** | 0000001 |
| **Format:** | quoted string, 7 character max, parameters with less than 7 characters are right justified and preceded with 0's (i.e., "8910" is interpreted as "0008910"). |
| **Example:** | :TRANsmit:CH1:UNITid "567" |
| | Sets Unit ID for Transmit Channel to 0000567 |
| **Query Response:** | :TRANsmit:CH1:UNITid? |
| | 0000567 |

## 2.5      EXTERNAL MODULATION GENERATOR

### 2.5.1      External Modulation Source - Enable

**MOD:GENerator:ESOurce:ENABle**
**MOD:GENerator:ESOurce:ENABle?**

| | |
|---|---|
| **Description:** | Set command Enables/Disables External Modulation source. |
| | Query command returns parameter setting. |
| **Parameter:** | OFF \| ON \| 0 \| 1 |
| **Default Value:** | OFF |
| **Set/Query Format:** | Boolean |
| **Example:** | MOD:GENerator:ESOurce:ENABle ON |
| | Enables selected External Modulation source. |
| **Query Response:** | MOD:GENerator:ESOurce:ENABle? |
| | 1 |

| NOTE | RF:ESOurce:ENABle deprecated in software version 1.7.9. |
|---|---|

### 2.5.2      External Modulation Generator - Impedance

**MOD:GENerator:ESOurce:SOURce:LOAD**
**MOD:GENerator:ESOurce:SOURce:LOAD?**

| | |
|---|---|
| **Description:** | Set command defines the Impedance of External Modulation source. |
| | Query command returns parameter setting. |
| **Parameter:** | UNBHI \| UNB600 |
| **Default Value:** | UNB600 |
| **Set/Query Format:** | CPD \| CRD |
| **Example:** | MOD:GENerator:ESOurce:SOURce:LOAD UNBHI |
| | Sets Impedance of External Source to Unbalanced Hi-Z. |
| **Query Response:** | MOD:GENerator:ESOurce:SOURce:LOAD? |
| | UNBHI |

| NOTE | :RF:ESOurce:SOURce:LOAD deprecated in software version 1.7.9. |
|---|---|

### 2.5.3      External Modulation Generator - Level

**MOD:GENerator:ESOurce:LEVel**
**MOD:GENerator:ESOurce:LEVel?**

| | |
|---|---|
| **Description:** | Set command defines level of the External Modulation Generator. |
| | Query command returns parameter setting. |
| **Range:** | 1.0 Hz to 150.0 kHz |
| **Units:** | Hz \| kHz |
| **Default Value:** | 2.5 kHz |
| **Set/Query Format:** | NR2 <units> \| NR1 <Hz> |
| **Example:** | MOD:GENerator:ESOurce:LEVel 100kHz |
| | Sets Level of the External Moduation Generator to 100.0 kHz |
| **Query Response:** | MOD:GENerator:ESOurce:LEVel? |
| | 10000 |

## 2.5.4      External Modulation Generator - Level in Percent

**MOD:GENerator:ESOurce:LEVel:PERcent**
**MOD:GENerator:ESOurce:LEVel:PERcent?**

| | |
|---|---|
| **Description:** | Set command defines level of the External Modulation Generator as a percent. |
| | Query command returns parameter setting. |
| **Range:** | 0.0% to 100% |
| **Units:** | % |
| **Default Value:** | 1.667% |
| **Set/Query Format:** | NR2 |
| **Example:** | MOD:GENerator:ESOurce:LEVel:PERcent 25 |
| | Sets Level of the External Moduation Generator to 25.0%. |
| **Query Response:** | MOD:GENerator:ESOurce:LEVel:PERcent? |
| | 25 |

## 2.5.5      External Modulation Generator - Source

**MOD:GENerator:ESOurce:SOURce**
**MOD:GENerator:ESOurce:SOURce?**

| | |
|---|---|
| **Description:** | Set command defines external source for the Modulation Generator. |
| | Query command returns parameter setting. |
| **Parameter:** | AUD1 \| AUD2 \| MIC \| BAL |
| **Default Value:** | AUD1 |
| **Set/Query Format:** | CPD \| CRD |
| **Example:** | MOD:GENerator:ESOurce:SOURce MIC |
| | Select Microphone as the External Modulation Source. |
| **Query Response:** | MOD:GENerator:ESOurce:SOURce? |
| | MIC |

| NOTE | :RF:ESOurce:SOURce has been deprecated in software version 1.7.9. |
|---|---|

## 2.6          MODULATION GENERATOR CONFIGURATION

### 2.6.1          Modulation Generators - Enable

**:MOD:GENerator:SOURceN:ENABle**
**:MOD:GENerator:SOURceN:ENABle?**

| | |
|---|---|
| **Description:** | Set command Enables/Disables the specified Modulation Generator. |
| | Query command returns parameter setting. |
| **Parameter:** | OFF \| ON \| 0 \| 1 |
| **Default Value:** | OFF |
| **Set/Query Format:** | Boolean |
| **Example:** | :MOD:GENerator:SOURce1:ENABle ON |
| | Enables Modulation Generator 1. |
| **Query Response:** | :MOD:GENerator:SOURce1:ENABle? |
| | 1 |

> NOTE
>
> :RF:MODulatorN:ENABle deprecated in software version 1.7.9.
> SourceN = 1, 2 or 3 (Modulator 1, 2 or 3)

### 2.6.2          Modulation Generators - Frequency

**:MOD:GENerator:SOURceN:FREQuency**
**:MOD:GENerator:SOURceN:FREQuency?**

| | |
|---|---|
| **Description:** | Set command defines Frequency for the specified Modulation Generator. |
| | Query command returns parameter setting. |
| **Range:** | 1.0 Hz to 5.0 kHz |
| **Units:** | Hz \| kHz |
| **Default Value:** | Mod 1: 1.0 kHz |
| | Mod 2: 300.0 Hz |
| | Mod 3: 3.4 kHz |
| **Set/Query Format:** | NRf \| NR2 (Hz) |
| **Example:** | :MOD:GENerator:SOURce1:FREQuency 2kHz |
| | Sets Modulation Generator 1 Frequency to 2.0 kHz. |
| **Query Response:** | :MOD:GENerator:SOURce1:FREQuency? |
| | 2000.0 |

> NOTE
>
> RF:MODulatorN:FREQuency deprecated in software version 1.7.9.
> SOURceN = 1, 2 or 3 (Mod Generator 1, 2 or 3)

### 2.6.3　　　Modulation Generators - Level

**:MOD:GENerator:SOURceN:LEVel**
**:MOD:GENerator:SOURceN:LEVel?**

|  |  |
|---|---|
| **Description:** | Set command defines Level for specified Modulation Generator. |
|  | Query command returns parameter setting. |
| **Range:** | 1.0 Hz to 150.0 kHz |
| **Units:** | Hz \| kHz |
| **Default Value:** | 2.5 kHz |
| **Set/Query Format:** | NRf \| NR2 (Hz) |
| **Example:** | :MOD:GENerator:SOURce3:LEVel 3kHz |
|  | Sets Modulation Generator 3 Level to 3.0 kHz. |
| **Query Response:** | :MOD:GENerator:SOURce3:LEVel? |
|  | 3000.00 |

| NOTE | :RF:MODulatorN:LEVel deprecated in software version 1.7.9.<br>SOURceN = 1, 2 or 3 (Modulator 1, 2 or 3) |
|---|---|

### 2.6.4　　　Modulation Generators - Level as a Percent (%)

**:MOD:GENerator:SOURceN:LEVel:PERcent**
**:MOD:GENerator:SOURceN:LEVel:PERcent?**

|  |  |
|---|---|
| **Description:** | Set command defines Level for specified Modulation Generator. |
|  | Query command returns parameter setting. |
| **Range:** | 0 to 100% |
| **Units:** | % (Percent) |
| **Default Value:** | 1.667% |
| **Set/Query Format:** | NRf \| NR2 (%) |
| **Example:** | :MOD:GENerator:SOURce3:LEVel:PERcent 15 |
|  | Sets Modulation Generator 3 Level to 15.0%. |
| **Query Response:** | :MOD:GENerator:SOURce3:LEVel:PERcent? |
|  | 15.0 |

| NOTE | :RF:MODulatorN:LEVel:PERcent deprecated in software version 1.7.9.<br>SOURceN = 1, 2 or 3 (Modulator 1, 2 or 3) |
|---|---|

## 2.6.5      Modulation Generators - Waveform

**:MOD:GENerator:SOURceN:SHAPe**
**:MOD:GENerator:SOURceN:SHAPe?**

| | |
|---|---|
| **Description:** | Set command defines Waveform Shape for the specified Modulation Generator. |
| | Query command returns parameter setting. |
| **Set Parameters:** | SINE \| SQUare \| TRIangle \| RAMP \| DCS \| DCSINV \| DTMF |
| **Query Data:** | SINE \| SQUare \| TRIangle \| RAMP \| DCS \| DCSINV \| DTMF \| TRKGEN |
| **Default Value:** | SINE |
| **Set/Query Format:** | CPD \| CRD |
| **Example:** | :MOD:GENerator:SOURce2:SHAPe SQUare |
| | Sets Modulation Generator 2 Waveform Shape to Square. |
| **Query Response:** | :MOD:GENerator:SOURce2:SHAPe? |
| | SQU |

> **NOTE**
>
> :RF:MODulatorN:SHAPe deprecated in software version 1.7.9.
>
> SOURceN = 1, 2 or 3 (Mod Generator 1, 2 or 3)
>
> DTMF is not a valid parameter for Modulator 2 and Modulator 3. DMTF may be returned as query data for Modulator 2.

## 2.7      MODULATION GENERATOR - TONE ENCODING

### 2.7.1      Modulation Generators - DCS Code

**:MOD:GENerator:SOURceN:CODEword "xxx"**
**:MOD:GENerator:SOURceN:CODEword?**

|  |  |
|---|---|
| **Description:** | Set command defines the DCS code for specified Mod Generator Source. |
| | Query command returns parameter setting. |
| **Parameter:** | Refer to Appendix A of 3900 Series Remote Programming Manual for supported DCS codes. |
| **Default Value:** | 023 |
| **Set/Query Format:** | NR1 |
| **Example:** | :MOD:GENerator:SOURce1:CODEword "071" |
| | Sets Mod Generator 1 DCS Code to 071. |
| **Query Response:** | :MOD:GENerator:SOURce1:CODEword? |
| | 071 |

| NOTE | Command only valid when Mod Generator Shape (Waveform) is set to DCS. |
|---|---|
| | SOURceN = 1, 2 or 3 (Mod Generator 1, 2 or 3) |

### 2.7.2      Modulation Generators - DTMF Burst Length

**:MOD:GENerator:SOURce1:MARK**
**:MOD:GENerator:SOURce1:MARK?**

|  |  |
|---|---|
| **Description:** | Set command defines length of time a DTMF burst is ON for Mod Generator 1. |
| | Query command returns parameter setting. |
| **Range:** | 1 to 6,000,000 ms |
| **Units:** | ms |
| **Default Value:** | 100 ms |
| **Set/Query Format:** | NRF \| NR1 |
| **Example:** | :MOD:GENerator:SOURce1:MARK 5000ms |
| | Sets length of Mod Generator 1 DTMF burst to 5000 milliseconds. |
| **Query Response:** | :MOD:GENerator:SOURce1:MARK? |
| | 5000 |

| NOTE | DTMF waveform is only supported on Mod Generator 1 |
|---|---|

### 2.7.3 Modulation Generators - DTMF Dead Time

**:MOD:GENerator:SOURce1:END**
**:MOD:GENerator:SOURce1:END?**

| | |
|---|---|
| **Description:** | Set command defines the dead time between DTMF tones for Mod Generator 1. |
| | Query command returns parameter setting. |
| **Range:** | 1 to 6,000,000 ms |
| **Units:** | ms |
| **Default Value:** | 500 ms |
| **Set/Query Format:** | NRf \| NR1 |
| **Example:** | :MOD:GENerator:SOURce1:END 1000ms |
| | Sets dead time between DTMF tones to 1000 milliseconds. |
| **Query Response:** | :MOD:GENerator:SOURce1:END? |
| | 1000 |

> **NOTE** DTMF waveform is only supported on Mod Generator 1.

### 2.7.4 Modulation Generators - DTMF Sequence

**:MOD:GENerator:SOURce1:SEQuence**
**:MOD:GENerator:SOURce1:SEQuence?**

| | |
|---|---|
| **Description:** | Set command defines DTMF Sequence when DTMF Waveform is selected. |
| | Query command returns parameter setting. |
| **Parameter:** | 0 \| 1 \| 2 \| 3 \| 4 \| 5 \| 6 \| 7 \| 8 \| 9 \| A \| B \| C \| D \| # \| * |
| | maximum of 16 characters encased in double quotes " " |
| **Default Value:** | 01234567 |
| **Set/Query Format:** | hex string |
| **Example:** | :MOD:GENerator:SOURce1:SEQuence "ABCD*1234#5678" |
| | Sets Mod Generator DTMF Sequence to ABCD*1245#5678. |
| **Query Response:** | :MOD:GENerator:SOURce1:SEQuence? |
| | ABCD*1245#5678 |

> **NOTE** Command only valid when Mod Generator 1 Waveform is set to DTMF.
> DMTF waveform is only supported on Mod Generator 1.

### 2.7.5    Modulation Generators - DTMF Sequence Mode

**:MOD:GENerator:SOURce1:SEQuence:Mode**
**:MOD:GENerator:SOURce1:SEQuence:Mode?**

| | |
|---|---|
| **Description:** | Set command defines DTMF sequence mode of operation for Mod Generator 1. Query command returns parameter setting. |
| **Parameter:** | SINGLE \| CONTINUOUS |
| **Default Value:** | SINGLE |
| **Set/Query Format:** | NR1 |
| **Example:** | :MOD:GENerator:SOURce1:SEQuence:Mode CONTINUOUS |
| | Sets DTMF Sequence Mode of Mod Generator 1 to Continuous. |
| **Query Response:** | :MOD:GENerator:SOURce1:SEQuence:Mode? |
| | CONTINUOUS |

NOTE: Command only valid when Mod Generator 1 Waveform is set to DTMF. DMTF waveform is only supported on Mod Generator 1.

### 2.7.6    Modulation Generators - DTMF Sequence Spacing

**:MOD:GENerator:SOURce1:SPACe**
**:MOD:GENerator:SOURce1:SPACe?**

| | |
|---|---|
| **Description:** | Set command defines the dead time between DTMF tone sequence when operating in Continuous Sequence mode of operation for RF Mod Generator 1. Query command returns parameter setting. |
| **Range:** | 1 to 6,000,000 ms |
| **Units:** | ms |
| **Default Value:** | 500 ms |
| **Set/Query Format:** | NRf \| NR1 |
| **Example:** | :MOD:GENerator:SOURce1:SPACe 1000ms |
| | Sets dead time between DTMF tone sequences to 1000 milliseconds. |
| **Query Response:** | :MOD:GENerator:SOURce1:SPACe? |
| | 1000 |

NOTE: Command only valid when Continuous Sequence Mode is selected. DTMF waveform is only supported on Mod Generator 1.

### 2.7.7    Modulation Generators - Encoding Enable

**:MOD:GENerator:ENCODE:ENABle**
**:MOD:GENerator:ENCODE:ENABle?**

| | |
|---|---|
| **Description:** | Set command Enables/Disables (sends) one Tone from Modulation Generator. Query command returns parameter setting. |
| **Parameter:** | OFF \| ON \| 0 \| 1 |
| **Default Value:** | OFF |
| **Set/Query Format:** | Boolean |
| **Example:** | :MOD:GENerator:ENCODE:ENABle ON |
| | Sends one Tone from Modulation Generator. |
| **Query Response:** | :MOD:GENerator:ENCODE:ENABle? |
| | 1 |

### 2.7.8 Modulation Generators - Encoded Signal Type

**:MOD:GENerator:ENCODE:TYPE**
**:MOD:GENerator:ENCODE:TYPE?**

| | |
|---|---|
| **Description:** | Set command defines type of signal being Encoded by the Modulation Generator. |
| | Query command returns parameter setting. |
| **Parameter:** | TWOTONE \| TONESEQ \| TONEREM |
| **Default:** | TWOTONE |
| **Set/Query Format:** | CPD \| CRD |
| **Example:** | :MOD:GENerator:ENCODE:TYPE TWOTONE |
| | Sets Modulation Generator Tone Signaling Type to Two Tone Sequential. |
| **Query Response:** | :MOD:GENerator:ENCODE:TYPE? |
| | TWOTONE |

### 2.7.9 Modulation Generators - Tone Remote Functional Duration

**:MOD:GEN:TONE:REMote:FUNCtion:DURation**
**:MOD:GEN:TONE:REMote:FUNCtion:DURation?**

| | |
|---|---|
| **Description:** | Set command defines length of single Tone. |
| | Query command returns parameter setting. |
| **Range:** | 20 to 500 ms |
| **Units:** | ms \| s |
| **Default:** | 40 ms |
| **Set/Query Format:** | NRf \| NR1 (ms) |
| **Example:** | :MOD:GEN:TONE:REMote:FUNCtion:DURation 50ms |
| | Sets length of single Tone burst to 50 milliseconds. |
| **Query Response:** | :MOD:GEN:TONE:REMote:FUNCtion:DURation? |
| | 50 |

### 2.7.10 Modulation Generators - Tone Remote Functional Frequency

**:MOD:GEN:TONE:REMote:FUNCtion:FREQuency**
**:MOD:GEN:TONE:REMote:FUNCtion:FREQuency?**

| | |
|---|---|
| **Description:** | Set command defines the Tone frequency. |
| | Query command returns parameter setting. |
| **Range:** | 1.0 Hz to 2.999 kHz |
| **Units:** | Hz \| kHz |
| **Default Value:** | 1.050 kHz |
| **Set/Query Format:** | NRf \| NR2 (Hz) |
| **Example:** | :MOD:GEN:TONE:REMote:FUNCtion:FREQuency 15Hz |
| | Sets Tone Frequency to 15.0 Hz. |
| **Query Response:** | :MOD:GEN:TONE:REMote:FUNCtion:FREQuency? |
| | 15.0 |

### 2.7.11    Modulation Generators - Tone Remote Functional Level

**:MOD:GEN:TONE:REMote:FUNCtion:LEVel**
**:MOD:GEN:TONE:REMote:FUNCtion:LEVel?**

| | |
|---|---|
| **Description:** | Set command defines the Tone Level. |
| | Query command returns parameter setting. |
| **Range:** | -20.0 to +20.0 dB |
| **Units:** | dB |
| **Default Value:** | 0.0 dB |
| **Set/Query Format:** | NRf \| NR2 |
| **Example:** | :MOD:GEN:TONE:REMote:FUNCtion:LEVel 5dB |
| | Sets the Tone Level to 5.0 dB. |
| **Query Response:** | :MOD:GEN:TONE:REMote:FUNCtion:LEVel? |
| | 5.0 |

### 2.7.12    Modulation Generators - Tone Remote Guard Duration

**:MOD:GEN:TONE:REMote:GUARD:DURation**
**:MOD:GEN:TONE:REMote:GUARD:DURation?**

| | |
|---|---|
| **Description:** | Set command defines length of single Tone Remote burst. |
| | Query command returns parameter setting. |
| **Range:** | 1 to 6,000,000 ms |
| **Units:** | ms \| s \| ks |
| **Default:** | 120 ms |
| **Set/Query Format:** | NRf \| NR1 (ms) |
| **Example:** | :MOD:GEN:TONE:REMote:GUARD:DURation 50ms |
| | Sets length of single Tone Remote burst to 50 milliseconds. |
| **Query Response:** | :MOD:GEN:TONE:REMote:GUARD:DURation? |
| | 50 |

### 2.7.13    Modulation Generators - Tone Remote Guard Frequency

**:MOD:GEN:TONE:REMote:GUARD:FREQuency**
**:MOD:GEN:TONE:REMote:GUARD:FREQuency?**

| | |
|---|---|
| **Description:** | Set command defines Tone Frequency. |
| | Query command returns parameter setting. |
| **Range:** | 1.0 Hz to 2.999 kHz |
| **Units:** | Hz \| kHz |
| **Default Value:** | 2.175 kHz |
| **Set/Query Format:** | NRf \| NR2 (Hz) |
| **Example:** | :MOD:GEN:TONE:REMote:GUARD:FREQuency 15Hz |
| | Sets Tone Frequency to 15.0 Hz. |
| **Query Response:** | :MOD:GEN:TONE:REMote:GUARD:FREQuency? |
| | 15.0 |

### 2.7.14 Modulation Generators - Tone Remote Guard Level

**:MOD:GEN:TONE:REMote:GUARD:LEVel**
**:MOD:GEN:TONE:REMote:GUARD:LEVel?**

| | |
|---|---|
| **Description:** | Set command defines the Tone Level. |
| | Query command returns parameter setting. |
| **Range:** | -20.0 to +20.0 dB |
| **Units:** | dB |
| **Default Value:** | -20.0 dB |
| **Set/Query Format:** | NRf \| NR2 |
| **Example:** | :MOD:GEN:TONE:REMote:GUARD:LEVel 5dB |
| | Sets the Tone Level to 5.0 dB. |
| **Query Response:** | :MOD:GEN:TONE:REMote:GUARD:LEVel? |
| | 5.0 |

### 2.7.15 Modulation Generators - Tone Remote Maximum Duration

**:MOD:GEN:TONE:REMote:MAXimum:DURation**
**:MOD:GEN:TONE:REMote:MAXimum:DURation?**

| | |
|---|---|
| **Description:** | Set command defines length of single Tone. |
| | Query command returns parameter setting. |
| **Range:** | 20 to 500 ms |
| **Units:** | ms \| s |
| **Default:** | 120 ms |
| **Set/Query Format:** | NRf \| NR1 (ms) |
| **Example:** | :MOD:GEN:TONE:REMote:MAXimum:DURation 50ms |
| | Sets length of single Tone burst to 50 milliseconds. |
| **Query Response:** | :MOD:GEN:TONE:REMote:MAXimum:DURation? |
| | 50 |

### 2.7.16 Modulation Generators - Tone Remote Maximum Frequency

**:MOD:GEN:TONE:REMote:MAXimum:FREQuency**
**:MOD:GEN:TONE:REMote:MAXimum:FREQuency?**

| | |
|---|---|
| **Description:** | Set command defines the Tone frequency. |
| | Query command returns parameter setting. |
| **Range:** | 1.0 Hz to 2.999 kHz |
| **Units:** | Hz \| kHz |
| **Default Value:** | 2.175 kHz |
| **Set/Query Format:** | NRf \| NR2 (Hz) |
| **Example:** | :MOD:GEN:TONE:REMote:MAXimum:FREQuency 15Hz |
| | Sets Tone Frequency to 15.0 Hz. |
| **Query Response:** | :MOD:GEN:TONE:REMote:MAXimum:FREQuency? |
| | 15.0 |

### 2.7.17 Modulation Generators - Tone Remote Maximum Level

**:MOD:GEN:TONE:REMote:MAXimum:LEVel**
**:MOD:GEN:TONE:REMote:MAXimum:LEVel?**

| | |
|---|---|
| **Description:** | Set command defines the Tone Level. |
| | Query command returns parameter setting. |
| **Range:** | -20.0 to +20.0 dB |
| **Units:** | dB |
| **Default Value:** | 10.0 dB |
| **Set/Query Format:** | NRf \| NR2 |
| **Example:** | :MOD:GEN:TONE:REMote:MAXimum:LEVel 5dB |
| | Sets the Tone Level to 5.0 dB. |
| **Query Response:** | :MOD:GEN:TONE:REMote:MAXimum:LEVel? |
| | 5.0 |

### 2.7.18 Modulation Generators - Tone Remote Reference Deviation

**:MOD:GEN:TONE:REMote:REFerence:DEViation**
**:MOD:GEN:TONE:REMote:REFerence:DEViation?**

| | |
|---|---|
| **Description:** | Set command defines the Tone Reference Deviation. |
| | Query command returns parameter setting. |
| **Range:** | 414.0 Hz to 150.0 kHz |
| **Units:** | Hz \| kHz |
| **Default Value:** | 2.5 kHz |
| **Set/Query Format:** | NRf \| NR2 (Hz) |
| **Example:** | :MOD:GEN:TONE:REMote:REFerence:DEViation 1.75kHz |
| | Sets the Tone Reference Deviation to 1.75 kHz. |
| **Query Response:** | :MOD:GEN:TONE:REMote:REFerence:DEViation? |
| | 1750.0 |

### 2.7.19 Modulation Generators - Tone Sequential FM Deviation

**:MOD:GEN:TONE:SEQuential:MASTER:DEViation**
**:MOD:GEN:TONE:SEQuential:MASTER:DEViation?**

| | |
|---|---|
| **Description:** | Set command defines the Modulation FM Deviation for Tone Sequential Encoding. |
| | Query command returns parameter setting. |
| **Range:** | 414.0 Hz to 150.0 kHz |
| **Units:** | Hz \| kHz |
| **Default Value:** | 2.5 kHz |
| **Set/Query Format:** | NRf \| NR2 (Hz) |
| **Example:** | :MOD:GEN:TONE:SEQuential:MASTER:DEViation 1.75kHz |
| | Sets the Tone FM Deviation to 1.75 kHz. |
| **Query Response:** | :MOD:GEN:TONE:SEQuential:MASTER:DEViation? |
| | 1750.0 |

### 2.7.20 Modulation Generators - Tone Sequential Mode

**:MOD:GEN:TONE:SEQuential:MODE**
**:MOD:GEN:TONE:SEQuential:MODE?**

| | |
|---|---|
| **Description:** | Set command selects Tone Mode of operation. |
| | Query command returns parameter setting. |
| **Parameter:** | SINGLE \| CONTINUOUS |
| **Default Value:** | SINGLE |
| **Set/Query Format:** | CPD \| CRD |
| **Example:** | :MOD:GEN:TONE:SEQuential:MODE CONTINUOUS |
| | Sets Tone Sequential Mode to Continuous. |
| **Query Response:** | :MOD:GEN:TONE:SEQuential:MODE? |
| | CONTINUOUS |

### 2.7.21 Modulation Generators - Tone Sequential Protocol

**:MOD:GEN:TONE:SEQuential:PROTocol**
**:MOD:GEN:TONE:SEQuential:PROTocol?**

| | |
|---|---|
| **Description:** | Set command selects Tone protocol. |
| | Query command returns parameter setting. |
| **Parameter:** | ZVEI1 \| ZVEI2 \| ZVEI3 \| PZVEI \| DZVEI \| PDZVEI \| CCIR1 \| CCIR2 \| PCCIR \| EEA \| EUROSIG \| NATEL \| EIA \| MODAT |
| **Default Value:** | ZVEI1 |
| **Set/Query Format:** | CPD \| CRD |
| **Example:** | :MOD:GEN:TONE:SEQuential:PROTocol PZVEI |
| | Sets Tone Protocol to PZVEI. |
| **Query Response:** | :MOD:GEN:TONE:SEQuential:PROTocol? |
| | PZVEI |

### 2.7.22 Modulation Generators - Tone Sequential Sequence

**:MOD:GEN:TONE:SEQuential:SEQuence**
**:MOD:GEN:TONE:SEQuential:SEQuence?**

| | |
|---|---|
| **Description:** | Set command defines  Sequence of Tone. |
| | Query command returns parameter setting. |
| **Parameter:** | 0 \| 1 \| 2 \| 3 \| 4 \| 5 \| 6 \| 7 \| 8 \| 9 \| A \| B \| C \| D \| E \| F |
| | maximum of 8 characters encased in double quotes " " |
| **Default Value:** | 01234567 |
| **Set/Query Format:** | hex string |
| **Example:** | :MOD:GEN:TONE:SEQuential:SEQuence "ABCD1245" |
| | Sets Sequence to ABCD1245. |
| **Query Response:** | :MOD:GEN:TONE:SEQuential:SEQuence? |
| | ABCD1245 |

## 2.7.23       Modulation Generators - Two Tone Sequential FM Deviation

**:MOD:GENerator:TTS:DEViation**
**:MOD:GENerator:TTS:DEViation?**

| | |
|---|---|
| **Description:** | Set command defines the Tone Deviation for Modulation Generator. |
| | Query command returns parameter setting. |
| **Range:** | 414.0 Hz to 150.0 kHz |
| **Units:** | Hz \| kHz |
| **Default Value:** | 2.5 kHz |
| **Set/Query Format:** | NRf \| NR2 (Hz) |
| **Example:** | :MOD:GENerator:TTS:DEViation 4kHz |
| | Sets Mod Generator Deviation to 4.0 kHz |
| **Query Response:** | :MOD:GENerator:TTS:DEViation? |
| | 4000.0 |


## 2.7.24       Modulation Generators - Two Tone Sequential Duration

**:MOD:GENerator:TTS:nTONE:DURation**
**:MOD:GENerator:TTS:nTONE:DURation?**

| | |
|---|---|
| **Description:** | Set command defines length of single Tone. |
| | Query command returns parameter setting. |
| **Range:** | 100 ms to 10 s |
| **Units:** | ms \| s |
| **Default:** | Tone A: 1.0 s |
| | Tone B: 3.0 s |
| **Set/Query Format:** | NRf \| NR1 (ms) |
| **Example:** | :MOD:GENerator:TTS:ATONE:DURation 5s |
| | Sets length of single Tone A burst to 5 seconds. |
| **Query Response:** | :MOD:GENerator:TTS:ATONE:DURation? |
| | 5000 |

| NOTE | nTone = A or B (Tone A or B) |
|---|---|

## 2.7.25      Modulation Generators - Two Tone Sequential Frequency

**:MOD:GENerator:TTS:nTONE:FREQuency**
**:MOD:GENerator:TTS:nTONE:FREQuency?**

|  |  |
|---|---|
| **Description:** | Set command defines Tone frequency for Modulation Generator. |
|  | Query command returns parameter setting. |
| **Range:** | 1.0 Hz to 2.999 kHz |
| **Units:** | Hz \| kHz |
| **Default Value:** | Tone A: 500.0 Hz |
|  | Tone B: 1.0 kHz |
| **Set/Query Format:** | NRf \| NR2 (Hz) |
| **Example:** | :MOD:GENerator:TTS:ATONE:FREQuency 150Hz |
|  | Sets Mod Generator Frequency for Tone A to 150.0 Hz. |
| **Query Response:** | :MOD:GENerator:TTS:ATONE:FREQuency? |
|  | 150.00 |

| NOTE | nTone = A or B (Tone A or B) |
|---|---|

## 2.8      GENERATOR/TRANSMIT CHANNEL CONFIGURATION

### 2.8.1      RF Generator - Enable

**:RF:GENerator:ENABle**
**:RF:GENerator:ENABle?**

| | |
|---|---|
| **Description:** | Set command Enables/Disables RF Generator. |
| | Query command returns parameter setting. |
| **Parameter:** | OFF \| ON \| 0 \| 1 |
| **Default Value:** | OFF |
| **Set/Query Format:** | Boolean |
| **Example:** | :RF:GENerator:ENABle ON |
| | Enables RF Generator. |
| **Query Response:** | :RF:GENerator:ENABle? |
| | 1 |

### 2.8.2      RF Generator - Frequency

**:RF:GENerator:CH1:FREQuency**
**:RF:GENerator:CH1:FREQuency?**

| | |
|---|---|
| **Description:** | Set command defines RF Generator Frequency. |
| | Query command returns parameter setting. |
| **Range:** | 100.0 kHz to 2.71 GHz |
| **Units:** | Hz \| kHz \| MHz \| GHz |
| **Default Value:** | 150.0 MHz |
| **Set/Query Format:** | NRf \| NR1 (Hz) |
| **Example:** | :RF:GENerator:CH1:FREQuency 850MHz |
| | Sets RF Generator Frequency to 850.0 MHz. |
| **Query Response:** | :RF:GENerator:CH1:FREQuency? |
| | 850000000 |

### 2.8.3      RF Generator - Level

**:RF:GENerator:CH1:LEVel**
**:RF:GENerator:CH1:LEVel?**

| | | |
|---|---|---|
| **Description:** | | Set command defines RF Generator Level. |
| | | Query command returns parameter setting. |
| **Range:** | **TR:** | -138.0 to -30.0 dBm |
| | **GEN:** | -130.0 to +10.0 dBm |
| **Units:** | | dBm |
| **Default Value:** | | -30.0 dBm |
| **Set/Query Format:** | | NRf \| NR2 (dBm) |
| **Example:** | | :RF:GENerator:CH1:LEVel -75dBm |
| | | Set RF Generator Level to -75.0 dBm. |
| **Query Response:** | | :RF:GENerator:CH1:LEVel? |
| | | -75.0 |

### 2.8.4 RF Generator - Level Mode

**:RF:GENerator:CH1:LMODe**
**:RF:GENerator:CH1:LMODe?**

| | |
|---|---|
| **Description:** | Set command defines RF Generator Level type. |
| | Query command returns parameter setting. |
| **Parameter:** | 0 = PD |
| | 1 = EMF |
| **Default Value:** | 0 (PD) |
| **Set/Query Format:** | NR1 |
| **Example:** | :RF:GENerator:CH1:LMODe 1 |
| | Set RF Generator Level to Display value in EMF. |
| **Query Response:** | :RF:GENerator:CH1:LMODe? |
| | 1 |

### 2.8.5 RF Generator - Offset Enable

**:CONFigure:OFFSet:GENerator:ENABle**
**:CONFigure:OFFSet:GENerator:ENABle?**

| | |
|---|---|
| **Description:** | Set command Enables/Disables RF Generator Offset. |
| | Query command returns parameter setting. |
| **Parameter:** | OFF \| ON \| 0 \| 1 |
| **Default Value:** | OFF |
| **Set/Query Format:** | Boolean |
| **Example:** | :CONFigure:OFFSet:GENerator:ENABle ON |
| | Enables RF Generator Offset. |
| **Query Response:** | :CONFigure:OFFSet:GENerator:ENABle? |
| | 1 |

### 2.8.6 RF Generator - Offset Value

**:CONFigure:OFFSet:GENerator:VALue**
**:CONFigure:OFFSet:GENerator:VALue?**

| | |
|---|---|
| **Description:** | Set command defines RF Generator Offset Value. |
| | Query command returns parameter setting. |
| **Range:** | -100.0 to +100.0 dB |
| **Units:** | dB |
| **Default Value:** | 0.0 dB |
| **Set/Query Format:** | NRf \| NR2 (dB) |
| **Example:** | :CONFigure:OFFSet:GENerator:VALue 2.5dB |
| | Set RF Generator Offset to 2.5 dB. |
| **Query Response:** | :CONFigure:OFFSet:GENerator:VALue? |
| | 2.5 |

### 2.8.7 RF Generator - Output Connector

**:RF:GENerator:PORT**
**:RF:GENerator:PORT?**

| | |
|---|---|
| **Description:** | Set command selects the RF Output Connector. |
| | Query command returns parameter setting. |
| **Parameter:** | TR \| GEN |
| **Default Value:** | TR |
| **Set/Query Format:** | CPD \| CRD |
| **Example:** | :RF:GENerator:PORT GEN |
| | Selects the GEN (Generator) Connector as RF Output Connector. |
| **Query Response:** | :RF:GENerator:PORT? |
| | GEN |

### 2.8.8 Transmit Channel - Pattern

**:TRANsmit:CH1:PATTern**
**:TRANsmit:CH1:PATTern?**

| | |
|---|---|
| **Description:** | Set command defines Pattern for dPMR Transmit Channel. |
| | Query command returns parameter setting. |
| **Parameter:** | STD1031 \| STDCAL \| STDCAL1 \| STDCAL5 \| FSWPN9 \| STDSILENCE \| STD511 \| STOREDSPEECH \| VOICE |
| **Default Value:** | STD511 |
| **Set/Query Format:** | CPD \| CRD |
| **Example:** | :TRANsmit:CH1:PATTern STDCAL |
| | Sets dPMR Channel to transmit Standard Calibration Pattern. |
| **Query Response:** | :TRANsmit:CH1:PATTern? |
| | STDCAL |

### 2.8.9 Transmit Channel - Protocol

**:TRANsmit:CH1:PROTocol**
**:TRANsmit:CH1:PROTocol?**

| | |
|---|---|
| **Description:** | Set command selects Transmit Protocol. |
| | Query command returns parameter setting. |
| **Parameter:** | ANALOG \| DPMR |
| **Default Value:** | DPMR |
| **Set/Query Format:** | CPD \| CRD |
| **Example:** | :TRANsmit:CH1:PROTocol ANALOG |
| | Sets Tx Channel Protocol to Analog. |
| **Query Response:** | :TRANsmit:CH1:PROTocol? |
| | ANALOG |

## 2.9          CABLE LOSS MEASUREMENTS

### 2.9.1          Cable Loss - List of Available Files

**CONFigure:OFFSet:FILElist?**

| | |
|---|---|
| **Description:** | Query command returns list of available Cable Loss files. |
| **Query Data Format:** | ascii string, space delimited |
| **Query Response:** | CONFigure:OFFSet:FILElist? |
| | {None} {Cable_1} { Cable_2} |

> **NOTE**  Command is only valid when the Tracking Generator Option is installed in the Test Set.

### 2.9.2          Cable Loss - Load RF Generator Reference File

**CONFigure:OFFSet:GENerator:FILE filename**
**CONFigure:OFFSet:GENerator:FILE?**

| | |
|---|---|
| **Description:** | Set command loads specified Cable Loss file. |
| | Query command returns parameter setting. |
| **Parameter:** | filename |
| **Example:** | CONFigure:OFFSet:GENerator:FILE Cable_1 |
| | Loads Cable Loss File titled Cable_1. |
| **Query Response:** | CONFigure:OFFSet:GENerator:FILE? |
| | Cable_1 |

> **NOTE**  Command is only valid when the Tracking Generator Option is installed in the Test Set.

### 2.9.3          Cable Loss - Load RF Analyzer Reference File

**CONFigure:OFFSet:ANALyzer:FILE filename**
**CONFigure:OFFSet:ANALyzer:FILE?**

| | |
|---|---|
| **Description:** | Set command loads specified Cable Loss file. |
| | Query command returns parameter setting. |
| **Parameter:** | filename |
| **Example:** | CONFigure:OFFSet:ANALyzer:FILE Cable_1 |
| | Loads Cable Loss File titled Cable_1. |
| **Query Response:** | CONFigure:OFFSet:ANALyzer:FILE? |
| | Cable_1 |

> **NOTE**  Command is only valid when the Tracking Generator Option is installed in the Test Set.

### 2.9.4 Cable Loss - Target File for Offset Query

**CABLeloss:TARGet:FILEname parameter**

| | |
|---|---|
| **Description:** | Set command targets specified Cable Loss file for offset value to be queried. |
| **Parameter:** | filename |
| **Example:** | CABLeloss:TARGet:FILEname Cable_1 |
| | Targets the Cable Loss File titled Cable_1. |
| **Query Response:** | CABLeloss:TARGet:FILEname? |
| | Cable_1 |

> **NOTE** Command is only valid when the Tracking Generator Option is installed in the Test Set.
>
> Related commands: CABLeloss:TARGet:FREQuency and CABLeloss:TARGet:OFFSet?

### 2.9.5 Cable Loss - Frequency for Offset Query

**CABLeloss:TARGet:FREQuency**
**CABLeloss:TARGet:FREQuency?**

| | |
|---|---|
| **Description:** | Set command defines the frequency in the cable loss file where the offset value is to be returned. |
| | Query command returns defined frequency value. |
| **Parameter:** | 100.0 to 1000.0 MHz |
| **Units:** | Hz \| kHz \| MHz |
| **Default Value:** | 100.00 MHz |
| **Set/Query Format:** | NRf \| NR2 (MHz) |
| **Example:** | CABLeloss:TARGet:FREQuency 650MHz |
| | Targets 650 MHz for Frequency Offset Query. |
| **Query Response:** | CABLeloss:TARGet:FREQuency? |
| | 650.0 |

> **NOTE** Command is only valid when the Tracking Generator Option is installed in the Test Set.
>
> Target file (CABLeloss:TARGet:FILEname) must be defined before sending this command.  Offset value is queried using CABLeloss:TARGet:OFFSet? command.

### 2.9.6 Cable Loss - Return Offset Value

**CABLeloss:TARGet:OFFSet?**

| | |
|---|---|
| **Description:** | Query command queries defined Cable Loss File and returns Offset value at frequency defined in CABLeloss:TARGet:Frequency command. |
| **Query Response:** | CABLeloss:TARGet:OFFSet? |
| | -0.04 |

> **NOTE** Command is only valid when the Tracking Generator Option is installed in the Test Set.
>
> Target file (CABLeloss:TARGet:FILEname) and frequency (CABLeloss:TARGet:FREQuency) must be defined before sending this command

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# Chapter 3 - Analyzer/Receive Channel
# Remote Commands

## 3.1 INTRODUCTION

This chapter describes the Remote Commands for configuring DPMR Transmit and Receive System Parameters.  Commands are listed alphabetically under Transmit and Receiver headings.

## 3.2 ACQUIRE SIGNAL

### 3.2.1 Reset Signal Acquisition

**:RECeive:RESET:ACQuisition**

**Description:**  Command resets signal acquisition

**Parameter/Query:**  none

## 3.3 AUDIO MEASUREMENTS CONFIGURATION

### 3.3.1 AF Measurements - Filter Type

**:AF:ANALyzer:MFILter**
**:AF:ANALyzer:MFILter?**

| | |
|---|---|
| **Description:** | Set command selects the Audio Analyzer Post Detection Filter. |
| | Query command returns parameter setting. |
| **Parameter:** | PSOPh \| None \| LP1 \| LP2 \| LP3 \| LP4 \| LP5 \| LP6 \| LP7 \| HP1 \| HP2 \| HP3 \| BP0 \| BP1 \| BP2 \| BP3 \| BP4 \| BP5 \| BP6 \| BP7 \| BP8 \| BP9 \| BP10 \| BP11 \| BP12 \| BP13 \| BP14 \| BP15 \| BP16 |

**where:**

| | |
|---|---|
| NONE = No Filter | BP2 = 0.3 to 5.0 kHz BP |
| PSOPh = Psoph (CMESS or CCITT) | BP3 = 0.3 to 20.0 kHz BP |
| LP1 = 300.0 Hz LP | BP4 = 0.3 to 15.0 kHz BP |
| LP2 = 5.0 kHz LP | BP5 = 20.0 to 300.0 Hz BP |
| LP3 = 20.0 kHz LP | BP6 = 0.02 to 3.0 kHz BP |
| LP4 = 15.0 kHz LP | BP7 = 0.02 to 3.4 kHz BP |
| LP5 = 3.0 kHz LP | BP8 = 0.02 to 5.0 kHz BP |
| LP6 = 625.0 kHz LP* | BP9 = 0.02 to 15.0 kHz BP |
| LP7 = 10.0 kHz LP* | BP10 = 0.02 to 20.0 kHz BP |
| LP8 = 100.0 Hz LP* | BP11 = 0.05 to 300.0 Hz BP |
| HP1 = 300.0 Hz HP | BP12 = 0.05 to 3.0 kHz BP |
| HP2 = 20.0 Hz HP | BP13 = 0.05 to 3.4 kHz BP |
| HP3 = 50.0 Hz HP | BP14 = 0.05 to 5.0 kHz BP |
| BP0 = 0.3 to 3.0 kHz BP | BP15 = 0.05 to 15.0 kHz BP |
| BP1 = 0.3 to 3.4 kHz BP | BP16 = 0.05 to 20.0 kHz BP |

| | |
|---|---|
| **Default Value:** | NONE (No Filter) |
| **Set/Query Format:** | CPD \| CRD |
| **Example:** | :AF:ANALyzer:MFILter LP3 |
| | Selects 20.0 kHz Low Pass Filter for AF measurements. |
| **Query Response:** | :AF:ANALyzer:MFILter? |
| | LP3 |

> **NOTE**
>
> Filter selected should be appropriate for signal received from UUT.
>
> When PSOPH is selected, Filter weight is defined using :CONFigure:AF:MFILter command.
>
> Test Set does not process any commands following this one until this command is completed.
>
> *LP6, LP7 and LP8 are used by the Audio Analyzer Tracking Generator and can not be defined by user, but may be returned as query data.

### 3.3.2    AF Measurements - Filter Weight

**:CONFigure:AF:MFILter**
**:CONFigure:AF:MFILter?**

| | |
|---|---|
| **Description:** | Set command defines the weight of psoph filter for AF Analyzer when Psoph filter is selected. |
| | Query command returns parameter setting. |
| **Parameter:** | CMESs \| CCITt |
| **Default Value:** | CMES |
| **Set/Query Format:** | CPD \| CRD |
| **Example:** | :CONFigure:AF:MFILter CCITt |
| | Selects CCITT Psoph Filter for AF measurement. |
| **Query Response:** | :CONFigure:AF:MFILter? |
| | CCIT |

NOTE: AF Filter type must be defined as Psoph (:AF:ANALyzer:MFILter PSOPH) for this command to be valid.

### 3.3.3    AF Measurements - Impedance

**:CONFigure:AF:ANALyzer:SOURce:LOAD**
**:CONFigure:AF:ANALyzer:SOURce:LOAD?**

| | |
|---|---|
| **Description:** | Set command defines the Impedance of selected Audio Frequency (Receiver) source. |
| | Query command returns parameter setting. |
| **Parameter:** | UNBHI \| UNB600 |
| **Default Value:** | Audio Source defined |
| **Set/Query Format:** | CPD \| CRD |
| **Example:** | :CONFigure:AF:ANALyzer:SOURce:LOAD UNBHI |
| | Sets Impedance of selected Audio Frequency (Receiver) Source to Unbalanced Hi-Z. |
| **Query Response:** | :CONFigure:AF:ANALyzer:SOURce:LOAD? |
| | UNBHI |

NOTE: Command not valid when AF Analyzer Source is set to Balanced (:CONFigure:AF:ANALyzer:SOURce is set to BAL).

### 3.3.4 AF Measurements - Impedance External Load

**:CONFigure:AF:ANALyzer:SOURce:VARiable:LOAD**
**:CONFigure:AF:ANALyzer:SOURce:VARiable:LOAD?**

|  |  |
|---|---|
| **Description:** | Set command defines the Impedance of selected Audio Frequency Analyzer (Receiver) source. |
|  | Query command returns parameter setting. |
| **Range:** | 1 to 9999 Ohms |
| **Units:** | Ohms |
| **Default Value:** | 8 Ohms |
| **Set/Query Format:** | NRf \| NR1 |
| **Example:** | :CONFigure:AF:ANALyzer:SOURce:VARiable:LOAD 100OHMS |
|  | Sets External Load to 100 Ohms for Audio Frequency Analyzer (Receiver). |
| **Query Response:** | :CONFigure:AF:ANALyzer:SOURce:VARiable:LOAD? |
|  | 100 |

| NOTE | Command only valid when Impedance is set to Unbalanced Hi-Z (:CONFigure:AF:ANALyzer:SOURce:LOAD UNBHI). |
|---|---|

### 3.3.5 AF Measurements - Impedance External Load Enable

**:CONFigure:AF:ANALyzer:SOURce:VARiable:LOAD:ENABle**
**:CONFigure:AF:ANALyzer:SOURce:VARiable:LOAD:ENABle?**

|  |  |
|---|---|
| **Description:** | Set command enables External Load for Impedance. |
|  | Query command returns parameter setting. |
| **Parameter:** | OFF \| ON \| 0 \| 1 |
| **Set/Query Format:** | Boolean |
| **Default Value:** | OFF |
| **Example:** | :CONFigure:AF:ANALyzer:SOURce:VARiable:LOAD:ENABle ON |
|  | Enables and applies defined External Impedance Load. |
| **Query Response:** | :CONFigure:AF:ANALyzer:SOURce:VARiable:LOAD:ENABle? |
|  | 1 |

| NOTE | Command :CONFigure:AF:ANALyzer:SOURce:VARiable:LOAD defines the external load applied when External Load is enabled. |
|---|---|

## 3.4      AUTOTUNE SETUP

### 3.4.1      RF Analyzer - AutoTune Frequency Resolution Value

**:CONFigure:RF:ANALyzer:FMODe:FRESolution**
**:CONFigure:RF:ANALyzer:FMODe:FRESolution?**

| | |
|---|---|
| **Description:** | Set command defines AutoTune Frequency Resolution value when AutoTune is enabled. |
| | Query command returns parameter setting. |
| **Parameter:** | 1 \| 10 \| 100 \| 1000 |
| **Units:** | Hz |
| **Default Value:** | 1 Hz |
| **Set/Query Format:** | NRf \| NR1 |
| **Example:** | :CONFigure:RF:ANALyzer:FMODe:FRESolution 10 |
| | Sets AutoTune Threshold to 10 Hz. |
| **Query Response:** | :CONFigure:RF:ANALyzer:FMODe:FRESolution? |
| | 10 |

### 3.4.2      RF Analyzer - AutoTune Mode of Operation

**:RF:ANALyzer:FMODe**
**:RF:ANALyzer:FMODe?**

| | |
|---|---|
| **Description:** | Set command selects AutoTune Frequency mode of operation. |
| | Query command returns parameter setting. |
| **Parameter:** | AUTo \| MANual |
| **Default Value:** | Manual |
| **Set/Query Format:** | CPD \| CRD |
| **Example:** | :RF:ANALyzer:FMODe AUTO |
| | Sets RF Analyzer to Autotune received frequency. |
| **Query Response:** | :RF:ANALyzer:FMODe? |
| | AUT |

| NOTE | AutoTune must be set to Manual to enter a specific Receive frequency. |
|---|---|

### 3.4.3         RF Analyzer - AutoTune State

**:RF:ANALyzer:FMODe:STATE**
**:RF:ANALyzer:FMODe:STATE?**

| | |
|---|---|
| **Description:** | Set command prepares AutoTune to provide status of the currently running or next initiated frequency search. |
| | Query Command returns state of AutoTune search. |
| **Parameters:** | SET |
| **Set/Query Format:** | CPD \| CRD |
| **Query Data:** | SET = Search has not yet been triggered or is not yet complete. |
| | ACQ = Search has found a frequency (acquired). |
| | FAIL = Search did not find a frequency. |
| **Example:** | :RF:ANALyzer:FMODe:STATE SET |
| | Prepares AutoTune to provide search status. |
| **Query Response:** | :RF:ANALyzer:FMODe:STATE? |
| | ACQ |

> **NOTE**    Command only valid when AutoTune mode of operation is set to Auto.

### 3.4.4         RF Analyzer - AutoTune Operating Status

**:RF:ANALyzer:FMODe:STATus?**

| | |
|---|---|
| **Description:** | Command indicates whether AutoTune frequency search is running or complete. |
| **Query Data:** | 0 = Search complete |
| | 1 = Searching |
| **Query Format:** | NR1 |
| **Query Response:** | :RF:ANALyzer:FMODe:STATus? |
| | 1 |

> **NOTE**    This command has been deprecated in software version 3.7.0. Replace the command with :RF:ANALyzer:FMODe:STATE command to avoid script failures.

### 3.4.5         RF Analyzer - AutoTune Start Frequency

**:RF:ANALyzer:FMODe:START**
**:RF:ANALyzer:FMODe:START?**

| | |
|---|---|
| **Description:** | Set command defines Start Frequency of AutoTune range. |
| | Query command returns parameter setting. |
| **Range:** | 100.0 kHz to 2.71 GHz |
| **Units:** | Hz \| kHz \| MHz \| GHz |
| **Default Value:** | 10.0 MHz |
| **Set/Query Format:** | NRf \| NR2 (Hz) |
| **Example:** | :RF:ANALyzer:FMODe:START 20kHz |
| | Sets AutoTune Start Frequency to 20.0 kHz. |
| **Query Response:** | :RF:ANALyzer:FMODe:START? |
| | 200000.00 (Hz) |

> **NOTE**    AutoTune mode must be set to Auto for command to be valid.

### 3.4.6    RF Analyzer - AutoTune Start Frequency Enable

**:RF:ANALyzer:FMODe:START:ENABle**
**:RF:ANALyzer:FMODe:START:ENABle?**

| | |
|---|---|
| **Description:** | Set command activates/deactivates AutoTune Start frequency. |
| | Query command returns parameter setting. |
| **Parameter:** | OFF \| ON \| 0 \| 1 |
| **Default Value:** | OFF |
| **Set/Query Format:** | Boolean |
| **Example:** | :RF:ANALyzer:FMODe:START:ENABle ON |
| | Activates AutoTune Start frequency. |
| **Query Response:** | :RF:ANALyzer:FMODe:START:ENABle? |
| | 1 |

| NOTE | Command only valid when AutoTune mode of operation is set to Auto. |
|---|---|

### 3.4.7    RF Analyzer - AutoTune Stop Frequency

**:RF:ANALyzer:FMODe:STOP**
**:RF:ANALyzer:FMODe:STOP?**

| | |
|---|---|
| **Description:** | Set command defines the Stop Frequency of AutoTune range. |
| | Query command returns parameter setting. |
| **Parameter:** | 100.0 kHz to 2.71 GHz |
| **Units:** | Hz \| kHz \| MHz \| GHz |
| **Default Value:** | 500.0 MHz |
| **Set/Query Format:** | NRf \| NR2 (Hz) |
| **Example:** | :RF:ANALyzer:FMODe:STOP 650MHz |
| | Sets RF Analyzer AutoTune Stop Frequency to 650.0 MHz. |
| **Query Response:** | :RF:ANALyzer:FMODe:STOP? |
| | 650000000.00 |

| NOTE | Command only valid when AutoTune mode of operation is set to Auto. |
|---|---|

### 3.4.8    RF Analyzer - AutoTune Stop Frequency Enable

**:RF:ANALyzer:FMODe:STOP:ENABle**
**:RF:ANALyzer:FMODe:STOP:ENABle?**

| | |
|---|---|
| **Description:** | Set command enables/disables AutoTune Stop Frequency. |
| | Query command returns parameter setting. |
| **Parameter:** | OFF \| ON \| 0 \| 1 |
| **Default Value:** | OFF |
| **Set/Query Format:** | Boolean |
| **Example:** | :RF:ANALyzer:FMODe:STOP:ENABle ON |
| | Activates AutoTune Stop Frequency. |
| **Query Response:** | :RF:ANALyzer:FMODe:STOP:ENABle? |
| | 1 |

| NOTE | Command only valid when AutoTune mode of operation is set to Auto. |
|---|---|

### 3.4.9 RF Analyzer - AutoTune Threshold Value

**:RF:ANALyzer:FMODe:THREsh**
**:RF:ANALyzer:FMODe:THREsh?**

| | |
|---|---|
| **Description:** | Set command defines the AutoTune Threshold value. |
| | Query command returns parameter setting. |
| **Range:** | -75.0 to +20.0 dBm |
| **Units:** | dBm |
| **Default Value:** | -30.0 dBm |
| **Set/Query Format:** | NRF \| NR2 |
| **Example:** | RF:ANALyzer:FMODe:THREsh -45dBm |
| | Sets AutoTune Threshold value to -45.0 dBm. |
| **Query Response:** | RF:ANALyzer:FMODe:THREsh? |
| | -45.000000 |

NOTE :CONFigure:RF:ANALyzer:THREsh command also supported for this function.

## 3.5       AF ANALYZER - TONE DECODE

### 3.5.1       AF Analyzer - Clear Decode Log

**:AF:ANALyzer:DECODE:LOGS:CLEAR**

| | |
|---|---|
| **Description:** | Command clears all AF data logs for Tone Remote, Tone Sequential and Two Tone Sequential signal types. |
| **Parameter/Query:** | none |

### 3.5.2       AF Analyzer - DCS Decode Value

**:FETCh:AF:ANALyzer:DECODE:DCS:VALue?**

| | |
|---|---|
| **Description:** | Command returns decode value of received signal. |
| **Query Format:** | ascii |
| **Query Response:** | :FETCh:AF:ANALyzer:DECODE:DCS:VALue? |
| | 047 |

### 3.5.3       AF Analyzer - Decode Protocol

**:AF:ANALyzer:DECODE:PROTocol**
**:AF:ANALyzer:DECODE:PROTocol?**

| | |
|---|---|
| **Description:** | Set command selects Protocol to be decoded by the AF Analyzer. |
| | Query command returns parameter setting. |
| **Parameter:** | ZVEI1 \| ZVEI2 \| ZVEI3 \| PZVEI \| DZVEI \| PDZVEI \| CCIR1 \| CCIR2 \| PCCIR \| EEA \| EUROSIG \| NATEL \| EIA \| MODAT |
| **Default Value:** | ZVEI1 |
| **Set/Query Format:** | CPD \| CRD |
| **Example:** | :AF:ANALyzer:DECODE:PROTocol PZVEI |
| | Sets AF Analyzer to decode PZVEI Protocol. |
| **Query Response:** | :AF:ANALyzer:DECODE:PROTocol? |
| | PZVEI |

### 3.5.4       AF Analyzer - DTMF Decode Value

**:FETCh:AF:ANALyzer:DECODE:DTMF:VALue?**

| | |
|---|---|
| **Description:** | Command returns decode value of received signal. |
| **Query Format:** | ascii |
| **Query Response:** | :FETCh:AF:ANALyzer:DECODE:DTMF:VALue? |
| | 047 |

### 3.5.5　　　 AF Analyzer - Tone Remote Decode Data

**:FETCh:AF:ANALyzer:DECODE:TONEREM:LOG?**

| | |
|---|---|
| **Description:** | Command returns received Tone Remote data. |
| **Query Data:** | <frequency>,<spec frequency>,<% error>,<freq error>,<duration> |
| **frequency (NR2):** | Hz |
| **spec frequency (NR2):** | Hz |
| **% error (NR2):** | percent (%) |
| **freq error (NR2):** | Hz |
| **duration (NR2):** | ms |
| **no activity:** | returned when no log data is available |
| **Query Response:** | :FETCh:AF:ANALyzer:DECODE:TONEREM:LOG? |
| | 2173.8,2175.0,0.054,1.2,1422.9 |
| | 1048.8,1050.0,0.112,1.2,1422.9 |
| | 2173.8,2175.0,0.054,1.2,1422.9 |

### 3.5.6　　　 AF Analyzer - Tone Sequential Decode Data

**:FETCh:AF:ANALyzer:DECODE:TONESEQ:LOG?**

| | |
|---|---|
| **Description:** | Command returns received Tone Sequential data. |
| **Query Format:** | ascii data string |
| **Query Data:** | <decoded tone>,<frequency>,<spec frequency>,<% error>,<freq error>,<duration> |
| **decoded tone (hex):** | 0 \| 1 \| 2 \| 3 \| 4 \| 5 \| 6 \| 7 \| A \| B \| C \| D \| E \| F |
| **frequency (NR2):** | Hz |
| **spec frequency (NR2):** | Hz |
| **% error (NR2):** | percent (%) |
| **freq error (NR2):** | Hz |
| **duration (NR2):** | ms |
| **no activity:** | returned when no log data is available |
| **Query Response:** | :FETCh:AF:ANALyzer:DECODE:TONESEQ:LOG? |
| | 0,2399.4,2400.0,0.024,0.6,85.3 |
| | 1,1060.5,1060.0,0.052,0.5,64.0 |
| | 2,1160.2,1160.0,0.013,0.2,74.7 |
| | 3,1280.3,1270.0,0.809,10.3,74.7 |
| | 4,1400.4,1400.0,0.028,0.4,74.7 |

### 3.5.7 AF Analyzer - Two Tone Sequential Decode Data

**:FETCh:AF:ANALyzer:DECODE:TWOTONE:LOG?**

|  |  |
|---|---|
| **Description:** | Command returns received Two Tone Sequential data. |
| **Query Data:** | <frequency>,<duration> |
| **frequency (NR2):** | Hz |
| **duration (NR2):** | ms |
| **no activity:** | returned when no log data is available |
| **Query Response:** | :FETCh:AF:ANALyzer:DECODE:TWOTONE:LOG? |
| | 1004.9,7349.3 |
| | 501.0,1013.3 |
| | 999.0,3008.0 |
| | 501.0,1013.3 |
| | 999.0,3008.0 |

### 3.5.8 AF Analyzer - Decode Signal Type

**:AF:ANALyzer:DECODE:TYPE**
**:AF:ANALyzer:DECODE:TYPE?**

|  |  |
|---|---|
| **Description:** | Set command defines type of Signal being Decoded by the Audio Analyzer. |
| | Query command returns parameter setting. |
| **Parameter:** | OFF \| DTMF \| TONESEQ \| TONEREM \| TWOTONE |
| **Default:** | OFF (Demod) |
| **Set/Query Format:** | CPD \| CRD |
| **Example:** | :AF:ANALyzer:DECODE:TYPE TONESEQ |
| | Sets type of signal being decoded by Audio Analyzer to Tone Sequential. |
| **Query Response:** | :AF:ANALyzer:DECODE:TYPE? |
| | TONESEQ |

| NOTE | :AF:ANALyzer:DECODE:TONETYPE was deprecated in software version 1.7.9. |
|---|---|

## 3.6 DPMR DECODE PARAMETERS

### 3.6.1 Decode - Called ID

**:RECeive:CH1:CALLid:VALue?**

**Description:** Returns Called ID value contained in the signal received from the UUT.

**Example:** :RECeive:CH1:CALLid:VALue 567

### 3.6.2 Decode - Called ID Status

**:RECeive:CH1:CALLid:STATus?**

**Description:** Returns status of the Called ID value received from the UUT.

**Query Data:** VALID | INVALID | NOTAPPLICABLE

**Example:** :RECeive:CH1:CALLid:STATus?

VALID

### 3.6.3 Decode - Channel Code

**:RECeive:CH1:CC:VALue?**

**Description:** Returns the Channel Code value contained in the signal received from the UUT.

**Example:** :RECeive:CH1:CC:VALue?

3587

### 3.6.4 Decode - Channel Code Status

**:RECeive:CH1:CC:STATus?**

**Description:** Returns status of the Channel Code value received from the UUT.

**Query Data:** VALID | INVALID | NOTAPPLICABLE

**Example:** :RECeive:CH1:CC:STATus?

INVALID

### 3.6.5 Decode - Clear Decoded Data

**:RECeive:CH1:DECODE:CLEar**

**Description:** Sending command clears all decoded data values.

### 3.6.6 Decode - Communication Format

**:RECeive:CH1:COMMs:FORMat:VALue?**

**Description:** Returns Communication Format value contained in the signal received from the UUT.

**Example:** :RECeive:CH1:COMMs:FORMat:VALue?

3587

### 3.6.7 Decode - Communication Format Status

**:RECeive:CH1:COMMs:FORMat:STATus?**

**Description:** Returns status of the Communication Format value received from the UUT.

**Query Data:** VALID | INVALID | NOTAPPLICABLE

**Example:** :RECeive:CH1:COMMs:FORMat:STATus?
VALID

### 3.6.8 Decode - Emergency Priority

**:RECeive:CH1:EMERgency:PRIority:VALue?**

**Description:** Returns Emergency Priority value contained in the signal received from the UUT.

**Example:** :RECeive:CH1:EMERgency:PRIority:VALue?
0

### 3.6.9 Decode - Emergency Priority Status

**:RECeive:CH1:EMERgency:PRIority:STATus?**

**Description:** Returns status of Emergency Priority value received from the UUT.

**Query Data:** VALID | INVALID | NOTAPPLICABLE

**Example:** :RECeive:CH1:EMERgency:PRIority:STATus?
INVALID

### 3.6.10 Decode - Unit Identifier

**:RECeive:CH1:UNITid:VALue?**

**Description:** Returns Unit Identifier value contained in the signal received from the UUT.

**Example:** :RECeive:CH1:UNITid:VALue?
0000567

### 3.6.11 Decode - Unit Identifier Status

**:RECeive:CH1:UNITid:STATus?**

**Description:** Returns status of the Unit Identifier value received from the UUT.

**Query Data:** VALID | INVALID | NOTAPPLICABLE

**Example:** :RECeive:CH1:UNITid:STATus?
INVALID

## 3.7 MODULATION ANALYZER - TONE DECODING

### 3.7.1 Modulation Analyzers - Clear Decode Log

**:MOD:ANALyzer:DECODE:LOGS:CLEAR**

**Description:** Command clears all modulation data logs for Tone Remote, Tone Sequential and Two Tone Sequential signal types.

**Parameter/Query:** none

### 3.7.2 Modulation Analyzers - DCS Decode Value

**:FETCh:MOD:ANALyzer:DECODE:DCS:VALue?**

**Description:** Command returns decode value of received signal.

**Query Format:** ascii

**Query Response:** :FETCh:MOD:ANALyzer:DECODE:DCS:VALue?

047

### 3.7.3 Modulation Analyzers - Decode Protocol

**:MOD:ANALyzer:DECODE:PROTocol**
**:MOD:ANALyzer:DECODE:PROTocol?**

**Description:** Set command selects Protocol to be decoded by the Modulation Analyzer.

Query command returns parameter setting.

**Parameter:** ZVEI1 | ZVEI2 | ZVEI3 | PZVEI | DZVEI | PDZVEI | CCIR1 | CCIR2 | PCCIR | EEA | EUROSIG | NATEL | EIA | MODAT

**Default Value:** ZVEI1

**Set/Query Format:** CPD | CRD

**Example:** :MOD:ANALyzer:DECODE:PROTocol PZVEI

Sets Modulation Analyzer to decode PZVEI Protocol.

**Query Response:** :MOD:ANALyzer:DECODE:PROTocol?

PZVEI

### 3.7.4 Modulation Analyzers - DTMF Decode Value

**:FETCh:MOD:ANALyzer:DECODE:DTMF:VALue?**

**Description:** Command returns decode value of received signal.

**Query Format:** ascii

**Query Response:** :FETCh:MOD:ANALyzer:DECODE:DTMF:VALue?

047

### 3.7.5        Modulation Analyzers - Tone Remote Decoded Data

**:FETCh:MOD:ANALyzer:DECODE:TONEREM:LOG?**

| | |
|---|---|
| **Description:** | Command returns received Tone Remote data. |
| **Query Data:** | <frequency>,<spec frequency>,<% error>,<freq error>,<duration> |
| **frequency (NR2):** | Hz |
| **spec frequency (NR2):** | Hz |
| **% error (NR2):** | percent (%) |
| **freq error (NR2):** | Hz |
| **duration (NR2):** | ms |
| **no activity:** | returned when no log data is available |
| **Query Response:** | :FETCh:MOD:ANALyzer:DECODE:TONEREM:LOG? |
| | 2173.8,2175.0,0.054,1.2,1422.9 |
| | 1051.8,1050.0,0.167,1.8,1422.9 |
| | 2176.8,2175.0,0.081,1.8,1422.9 |

### 3.7.6        Modulation Analyzers - Tone Sequential Decoded Data

**:FETCh:MOD:ANALyzer:DECODE:TONESEQ:LOG?**

| | |
|---|---|
| **Description:** | Command returns received Modulation Tone Sequential data. |
| **Query Format:** | ascii data string |
| **Query Data:** | <decoded tone>,<frequency>,<spec frequency>,<% error>,<freq error>,<duration> |
| **decoded tone (hex):** | 0 \| 1 \| 2 \| 3 \| 4 \| 5 \| 6 \| 7 \| A \| B \| C \| D \| E \| F |
| **frequency (NR2):** | Hz |
| **spec frequency (NR2):** | Hz |
| **% error (NR2):** | percent (%) |
| **freq error (NR2):** | Hz |
| **duration (NR2):** | ms |
| **no activity:** | returned when no log data is available |
| **Query Response:** | :FETCh:MOD:ANALyzer:DECODE:TONESEQ:LOG? |
| | 0,2399.4,2400.0,0.024,0.6,74.7 |
| | 1,1057.6,1060.0,0.225,2.4,74.7 |
| | 2,1163.1,1160.0,0.266,3.1,64.0 |
| | 3,1274.4,1270.0,0.348,4.4,74.7 |
| | 4,1400.4,1400.0,0.028,0.4,74.7 |

### 3.7.7        Modulation Analyzers - Two Tone Sequential Decoded Data

**:FETCh:MOD:ANALyzer:DECODE:TWOTONE:LOG?**

| | |
|---|---|
| **Description:** | Command returns received Two Tone Sequential data. |
| **Query Data:** | <frequency>,<duration> |
| **frequency (NR2):** | Hz |
| **duration (NR2):** | ms |
| **no activity:** | returned when no log data is available |
| **Query Response:** | :FETCh:MOD:ANALyzer:DECODE:TWOTONE:LOG? |
| | 501.0,1013.3 |
| | 1002.0,3008.0 |

## 3.7.8      Modulation Analyzers - Decode Signal Tone

### :MOD:ANALyzer:DECODE:TYPE
### :MOD:ANALyzer:DECODE:TYPE?

| | |
|---|---|
| **Description:** | Set command defines type of Signal being Decoded by the Modulation Analyzer. |
| | Query command returns parameter setting. |
| **Parameter:** | OFF \| DCS \| DCSINV \| DTMF \| TONESEQ \| TONEREM \| TWOTONE |
| **Default:** | OFF (Demod) |
| **Set/Query Format:** | CPD \| CRD |
| **Example:** | :MOD:ANALyzer:DECODE:TYPE DCS |
| | Sets type of signal being decoded by Modulation Analyzer to DCS. |
| **Query Response:** | :MOD:ANALyzer:DECODE:TYPE? |
| | DCS |

| NOTE | :MOD:ANALyzer:DECODE:TONETYPE deprecated in software version 1.7.9. |
|---|---|

## 3.8 RF ANALYZER CONFIGURATION

### 3.8.1 Function Generator / Demod Out Connector

**:CONFigure:PORT:FGEN**
**:CONFigure:PORT:FGEN?**

| | |
|---|---|
| **Description:** | Set command selects Function Generator / Demod Out Connector. |
| | Query command returns parameter setting. |
| **Parameter:** | FGEN \| AUDio \| DEMod |
| **Default Value:** | FGEN |
| **Set/Query Format:** | CPD \| CRD |
| **Example:** | :CONFigure:PORT:FGEN DEMod |
| | Selects Demod as the Function Generator / Demod Out Connector. |
| **Query Response:** | :CONFigure:PORT:FGEN? |
| | DEM |

### 3.8.2 RF Analyzer - AutoTune Frequency Resolution Value

**:CONFigure:RF:ANALyzer:FMODe:FRESolution**
**:CONFigure:RF:ANALyzer:FMODe:FRESolution?**

| | |
|---|---|
| **Description:** | Set command defines AutoTune Frequency Resolution value when AutoTune is enabled. |
| | Query command returns parameter setting. |
| **Parameter:** | 1 \| 10 \| 100 \| 1000 |
| **Units:** | Hz |
| **Default Value:** | 1 Hz |
| **Set/Query Format:** | NRf \| NR1 |
| **Example:** | :CONFigure:RF:ANALyzer:FMODe:FRESolution 10 |
| | Sets AutoTune Threshold to 10 Hz. |
| **Query Response:** | :CONFigure:RF:ANALyzer:FMODe:FRESolution? |
| | 10 |

### 3.8.3 RF Analyzer - AutoTune Mode of Operation

**:RF:ANALyzer:FMODe**
**:RF:ANALyzer:FMODe?**

| | |
|---|---|
| **Description:** | Set command selects AutoTune Frequency mode of operation. |
| | Query command returns parameter setting. |
| **Parameter:** | AUTo \| MANual |
| **Default Value:** | Manual |
| **Set/Query Format:** | CPD \| CRD |
| **Example:** | :RF:ANALyzer:FMODe AUTO |
| | Sets RF Analyzer to Autotune received frequency. |
| **Query Response:** | :RF:ANALyzer:FMODe? |
| | AUT |

| NOTE | AutoTune must be set to Manual to enter a specific Receive frequency. |
|---|---|

### 3.8.4      RF Analyzer - AutoTune Operating Status

**:RF:ANALyzer:FMODe:STATus?**

| | |
|---|---|
| **Description:** | Command indicates whether AutoTune frequency search is running or complete. |
| **Query Data:** | 0 = Search complete |
| | 1 = Searching |
| **Query Format:** | NR1 |
| **Query Response:** | :RF:ANALyzer:FMODe:STATus? |
| | 1 |

> **NOTE**    This command has been deprecated in software version 3.7.0. Replace the command with :RF:ANALyzer:FMODe:STATE command to avoid script failures.

### 3.8.5      RF Analyzer - AutoTune Start Frequency

**:RF:ANALyzer:FMODe:START**
**:RF:ANALyzer:FMODe:START?**

| | |
|---|---|
| **Description:** | Set command defines Start Frequency of AutoTune range. |
| | Query command returns parameter setting. |
| **Range:** | 100.0 kHz to 2.71 GHz |
| **Units:** | Hz \| kHz \| MHz \| GHz |
| **Default Value:** | 10.0 MHz |
| **Set/Query Format:** | NRf \| NR2 (Hz) |
| **Example:** | :RF:ANALyzer:FMODe:START 20kHz |
| | Sets AutoTune Start Frequency to 20.0 kHz. |
| **Query Response:** | :RF:ANALyzer:FMODe:START? |
| | 200000.00 (Hz) |

> **NOTE**    AutoTune mode must be set to Auto for command to be valid.

### 3.8.6      RF Analyzer - AutoTune Start Frequency Enable

**:RF:ANALyzer:FMODe:START:ENABle**
**:RF:ANALyzer:FMODe:START:ENABle?**

| | |
|---|---|
| **Description:** | Set command activates/deactivates AutoTune Start frequency. |
| | Query command returns parameter setting. |
| **Parameter:** | OFF \| ON \| 0 \| 1 |
| **Default Value:** | OFF |
| **Set/Query Format:** | Boolean |
| **Example:** | :RF:ANALyzer:FMODe:START:ENABle ON |
| | Activates AutoTune Start frequency. |
| **Query Response:** | :RF:ANALyzer:FMODe:START:ENABle? |
| | 1 |

> **NOTE**    Command only valid when AutoTune mode of operation is set to Auto.

### 3.8.7        RF Analyzer - AutoTune State

**:RF:ANALyzer:FMODe:STATE**
**:RF:ANALyzer:FMODe:STATE?**

| | |
|---|---|
| **Description:** | Set command prepares AutoTune to provide status of the currently running or next initiated frequency search. |
| | Query Command returns state of AutoTune search. |
| **Parameters:** | SET |
| **Set/Query Format:** | CPD \| CRD |
| **Query Data:** | SET = Search has not yet been triggered or is not yet complete. |
| | ACQ = Search has found a frequency (acquired). |
| | FAIL = Search did not find a frequency. |
| **Example:** | :RF:ANALyzer:FMODe:STATE SET |
| | Prepares AutoTune to provide search status. |
| **Query Response:** | :RF:ANALyzer:FMODe:STATE? |
| | ACQ |
| **NOTE** | Command only valid when AutoTune mode of operation is set to Auto. |

### 3.8.8        RF Analyzer - AutoTune Stop Frequency

**:RF:ANALyzer:FMODe:STOP**
**:RF:ANALyzer:FMODe:STOP?**

| | |
|---|---|
| **Description:** | Set command defines the Stop Frequency of AutoTune range. |
| | Query command returns parameter setting. |
| **Parameter:** | 100.0 kHz to 2.71 GHz |
| **Units:** | Hz \| kHz \| MHz \| GHz |
| **Default Value:** | 500.0 MHz |
| **Set/Query Format:** | NRf \| NR2 (Hz) |
| **Example:** | :RF:ANALyzer:FMODe:STOP 650MHz |
| | Sets RF Analyzer AutoTune Stop Frequency to 650.0 MHz. |
| **Query Response:** | :RF:ANALyzer:FMODe:STOP? |
| | 650000000.00 |
| **NOTE** | Command only valid when AutoTune mode of operation is set to Auto. |

### 3.8.9        RF Analyzer - AutoTune Stop Frequency Enable

**:RF:ANALyzer:FMODe:STOP:ENABle**
**:RF:ANALyzer:FMODe:STOP:ENABle?**

|                     |                                                          |
| ------------------: | -------------------------------------------------------- |
| **Description:**    | Set command enables/disables AutoTune Stop Frequency.    |
|                     | Query command returns parameter setting.                 |
| **Parameter:**      | OFF \| ON \| 0 \| 1                                      |
| **Default Value:**  | OFF                                                      |
| **Set/Query Format:** | Boolean                                                |
| **Example:**        | :RF:ANALyzer:FMODe:STOP:ENABle ON                        |
|                     | Activates AutoTune Stop Frequency.                       |
| **Query Response:** | :RF:ANALyzer:FMODe:STOP:ENABle?                          |
|                     | 1                                                        |

| NOTE | Command only valid when AutoTune mode of operation is set to Auto. |
| ---- | ----------------------------------------------------------------- |

### 3.8.10        RF Analyzer - AutoTune Threshold Value

**:RF:ANALyzer:FMODe:THREsh**
**:RF:ANALyzer:FMODe:THREsh?**

|                     |                                                          |
| ------------------: | -------------------------------------------------------- |
| **Description:**    | Set command defines the AutoTune Threshold value.        |
|                     | Query command returns parameter setting.                 |
| **Range:**          | -75.0 to +20.0 dBm                                       |
| **Units:**          | dBm                                                      |
| **Default Value:**  | -30.0 dBm                                                |
| **Set/Query Format:** | NRF \| NR2                                              |
| **Example:**        | RF:ANALyzer:FMODe:THREsh -45dBm                          |
|                     | Sets AutoTune Threshold value to -45.0 dBm.              |
| **Query Response:** | RF:ANALyzer:FMODe:THREsh?                                |
|                     | -45.000000                                               |

| NOTE | :CONFigure:RF:ANALyzer:THREsh command also supported for this function. |
| ---- | ----------------------------------------------------------------------- |

### 3.8.11    RF Analyzer - Channel Offset Value

**:RF:ANALyzer:CHn:OFFSet**
**:RF:ANALyzer:CHn:OFFSet?**

| | |
|---|---|
| **Description:** | Set command defines the Receive Channel Offset Value. |
| | Query command returns parameter setting. |
| **Range:** | -999.0 to +999.0 MHz |
| **Units:** | Hz \| kHz \| MHz \| GHz |
| **Default Value:** | 0.0 MHz |
| **Set/Query Format:** | NRf \| NR2 (Hz) |
| **Example:** | :RF:ANALyzer:CH1:OFFSet 5MHz |
| | Sets Receive Channel Offset to 5.0 MHz. |
| **Query Response:** | :RF:ANALyzer:CH1:OFFSet? |
| | 5000000.00 |

| NOTE | CHn = 1 or 2 (Channel 1 or 2).  Channel 2 is option enabled. |
|---|---|

### 3.8.12    RF Analyzer - FM IF Bandwidth

**:RF:ANALyzer:FMIF**
**:RF:ANALyzer:FMIF?**

| | |
|---|---|
| **Description:** | Set command defines the FM IF Bandwidth. |
| | Query command returns parameter setting. |
| **Parameter:** | 12.5 kHz \| 30.0 kHz \| 100.0 kHz |
| **Default Value:** | 12.5 kHz |
| **Set/Query Format:** | NRf \| NR2 |
| **Example:** | :RF:ANALyzer:FMIF 30kHz |
| | Sets RF Analyzer FM IF Bandwidth to 30.0 kHz. |
| **Query Response:** | :RF:ANALyzer:FMIF? |
| | 30.0kHz |

| NOTE | IF Bandwidth applies to ANALOG Protocol. |
|---|---|

### 3.8.13    RF Analyzer - Frequency

**:RF:ANALyzer:CH1:FREQuency**
**:RF:ANALyzer:CH1:FREQuency?**

| | |
|---|---|
| **Description:** | Set command defines the RF Analyzer Frequency for signal. |
| | Query command returns parameter setting. |
| **Range:** | 20.0 kHz to 2.71 GHz |
| **Units** | Hz \| kHz \| MHz \| GHz |
| **Default Value:** | 150.0 MHz |
| **Set/Query Format:** | NRF \| NR1 (Hz) |
| **Example:** | :RF:ANALyzer:CH1:FREQuency 650MHz |
| | Sets RF Analyzer Frequency to 650.0 MHz. |
| **Query Response:** | :RF:ANALyzer:CH1:FREQuency? |
| | 650000000 |

### 3.8.14 RF Analyzer - Input Connector

**:RF:ANALyzer:PORT**
**:RF:ANALyzer:PORT?**

| | |
|---|---|
| **Description:** | Set command selects the RF Input Connector. |
| | Query command returns parameter setting. |
| **Parameter:** | TR \| ANT |
| **Default Value:** | TR |
| **Set/Query Format:** | CPD \| CRD |
| **Example:** | :RF:ANALyzer:PORT ANT |
| | Selects Antenna Connector as RF Input Connector. |
| **Query Response:** | :RF:ANALyzer:PORT? |
| | ANT |

> **NOTE** Refer to 3900 Platform Specifications for maximum input values.

### 3.8.15 RF Analyzer - Offset Enable

**:CONFigure:OFFSet:ANALyzer:ENABle**
**:CONFigure:OFFSet:ANALyzer:ENABle?**

| | |
|---|---|
| **Description:** | Set command Enables/Disables the RF Analyzer Offset. |
| | Query command returns parameter setting. |
| **Parameter:** | OFF \| ON \| 0 \| 1 |
| **Default Value:** | OFF |
| **Set/Query Format:** | Boolean |
| **Example:** | :CONFigure:OFFSet:ANALyzer:ENABle ON |
| | Enables RF Analyzer Offset. |
| **Query Response:** | :CONFigure:OFFSet:ANALyzer:ENABle? |
| | 1 |

### 3.8.16 RF Analyzer - Offset Mode of Operation

**:RECeive:CH1:LOCK**
**:RECeive:CH1:LOCK?**

| | |
|---|---|
| **Description:** | Set command defines the RF Analyzer Offset mode of operation. |
| | Query command returns parameter setting. |
| **Parameter:** | OFF \| ON \| 0 \| 1 |
| **Default Value:** | OFF (Unlocked) |
| **Set/Query Format:** | Boolean |
| **Example:** | :RECeive:CH1:LOCK ON |
| | Locks Frequency Offset to RF Analyzer Frequency. |
| **Query Response:** | :RECeive:CH1:LOCK? |
| | 1 |

> **NOTE** Offset value defaults to 0.0 unless defined by user.

### 3.8.17 RF Analyzer - Offset Value

**:CONFigure:OFFSet:ANALyzer:VALue**
**:CONFigure:OFFSet:ANALyzer:VALue?**

| | |
|---|---|
| **Description:** | Set command defines the RF Analyzer Offset Value. |
| | Query command returns parameter setting. |
| **Range:** | -40.0 to +40.0 dB |
| **Units:** | dB |
| **Default Value:** | 0.0 dB |
| **Set/Query Format:** | NRf \| NR2 (Hz) |
| **Example:** | :CONFigure:OFFSet:ANALyzer:VALue -10dB |
| | Sets RF Analyzer Offset to -10.0 dB. |
| **Query Response:** | :CONFigure:OFFSet:ANALyzer:VALue? |
| | -10.00 |

### 3.8.18 Receiver - Pre-Amplifier Enable

**:RF:ANALyzer:RECeiver:AMP**
**:RF:ANALyzer:RECeiver:AMP?**

| | |
|---|---|
| **Description:** | Set command Enables/Disables Receiver Pre-Amplifier. |
| | Query command returns parameter setting. |
| **Parameter:** | OFF \| ON \| 0 \| 1 |
| **Default Value:** | OFF |
| **Set/Query Format:** | Boolean |
| **Example:** | :RF:ANALyzer:RrECeiver:AMP ON |
| | Enables Receiver Pre-Amplifier. |
| **Query Response:** | :RF:ANALyzer:RECeiver:AMP? |
| | 1 |

### 3.8.19      RF Analyzer - Receive Offset

**:RF:ANALyzer:CH1:OFFSet**
**:RF:ANALyzer:CH1:OFFSet?**

| | |
|---|---|
| **Description:** | Set command defines the Receive Offset Value. |
| | Query command returns parameter setting. |
| **Range:** | -999.0 to +999.0 MHz |
| **Units:** | Hz \| kHz \| MHz \| GHz |
| **Default Value:** | 0.0 MHz |
| **Set/Query Format:** | NRf \| NR2 (Hz) |
| **Example:** | :RF:ANALyzer:CH1:OFFSet -100kHz |
| | Sets Receive Offset to -100.0 kHz. |
| **Query Response:** | :RF:ANALyzer:CH1:OFFSet? |
| | -100000.00 |

### 3.8.20

### 3.8.21      Receive Channel - Protocol

**:RECeive:CH1:PROTocol**
**:RECeive:CH1:PROTocol?**

| | |
|---|---|
| **Description:** | Set command selects Receive Channel Protocol. |
| | Query command returns parameter setting. |
| **Parameter:** | ANALOG \| DPMR |
| **Default Value:** | DPMR |
| **Set/Query Format:** | CPD \| CRD |
| **Example:** | :RECeive:CH1:PROTocol ANALOG |
| | Sets Rx Channel Protocol to Analog. |
| **Query Response:** | :RECeive:CH1:PROTocol? |
| | ANALOG |

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# Chapter 4 - dPMR Signal Rx Meter
# Remote Commands

## 4.1 INTRODUCTION

This chapter describes the Remote Commands used for configuring and obtaining dPMR signal measurement data. Remote Commands are listed alphabetically by meter name.

## 4.2 RESET MEASUREMENT DATA

### 4.2.1 Reset Signal Acquisition

**:RECeive:RESET:ACQuisition**

**Description:** Command resets signal acquisition

**Parameter/Query:** none

## 4.3 BIT ERROR RATE (BER)

### 4.3.1 Bit Error Rate - Averages

**:METERs:BER:CH1:AVERaging**
**:METERs:BER:CH1:AVERaging?**

**Description:** Set command defines number of readings taken to calculate Average Bit Error Rate measurement.

Query command returns parameter setting.

**Range:** 1 to 1000

**Default Value:** 1

**Set/Query Format:** NR1

**Example:** :METERs:BER:CH1:AVERaging 100

Sets the number of readings taken to calculate Average Bit Error Rate measurement to 100.

**Query Response:** :METERs:BER:CH1:AVERaging?

100

### 4.3.2 Bit Error Rate - Average Measurement Reset

**:METERs:BER:CH1:CLEAR:AVG**

**Description:** Command clears and resets Average Bit Error Rate measurement.

**Parameter/Query:** none

### 4.3.3 Bit Error Rate - Lower Limit Enable

**:LIMits:BER:CH1:LOWer:ENABle**
**:LIMits:BER:CH1:LOWer:ENABle?**

| | |
|---|---|
| **Description:** | Set command Enables/Disables Lower Limit for Bit Error Rate measurement. Query command returns parameter setting. |
| **Parameter:** | OFF \| ON \| 0 \| 1 |
| **Default Value:** | OFF |
| **Set/Query Format:** | Boolean |
| **Example:** | :LIMits:BER:CH1:LOWer:ENABle ON |
| | Enables Lower Limit for Bit Error Rate measurement. |
| **Query Response:** | :LIMits:BER:CH1:LOWer:ENABle? |
| | 1 |

### 4.3.4 Bit Error Rate - Lower Limit Value

**:LIMits:BER:CH1:LOWer:VALue**
**:LIMits:BER:CH1:LOWer:VALue?**

| | |
|---|---|
| **Description:** | Set command defines Lower Limit Value for Bit Error Rate Measurement. Query command returns parameter setting. |
| **Range:** | 0.0 to 100.0% |
| **Units:** | % (percent) |
| **Default Value:** | 0.0% |
| **Set/Query Format:** | NRf \| NR2 |
| **Example:** | :LIMits:BER:CH1:LOWer:VALue 1 |
| | Sets Lower Limit Value for Bit Error Rate Measurement to 1.0%. |
| **Query Response:** | :LIMits:BER:CH1:LOWer:VALue? |
| | 1.0000000000 |

### 4.3.5 Bit Error Rate - Measurement Query

**:METERs:BER:CH1:STATus?**

| | |
|---|---|
| **Description:** | Command returns Bit Error Rate measurement data. |
| **Query Data:** | <statusbyte>,<failbyte>,<precision>,<percentage>,<avg>,<max>,<min>,<units> |
| **NOTE** | Refer to Chapter 1 for UUT Measurement Meter return data. |
| **Query Response:** | :METERs:BER:CH1:STATus? |
| | 0,0,10, 100.000, 0.0099751540,0.0100574717,0.0000000000,0 |

### 4.3.6 Bit Error Rate - Peak Measurement Reset

**:METERs:BER:CH1:CLEAR:PEAK**

| | |
|---|---|
| **Description:** | Command clears and resets Peak Bit Error Rate measurement. |
| **Parameter/Query:** | none |

### 4.3.7 Bit Error Rate - Receive Pattern

**:METERs:BER:PATTern**
**:METERs:BER:PATTern?**

| | |
|---|---|
| **Description:** | Set command defines Receive Pattern for Bit Error Rate measurement. |
| | Query command returns parameter setting. |
| **Parameter:** | STD1031 \| STDCAL \| STDCAL1 \| STDCAL5 \| FSWPN9 \| STDSILENCE \| STD511 \| FRAMESYNC |
| **Default Value:** | STD511 |
| **Set/Query Format:** | CPD \| CRD |
| **Example:** | :METERs:BER:PATTern STD1031 |
| | Sets Receive Pattern for Bit Error Rate measurement to Standard 1031 Pattern. |
| **Query Response:** | :METERs:BER:PATTern? |
| | STD1031 |

### 4.3.8 Bit Error Rate - Upper Limit Enable

**:LIMits:BER:CH1:UPPer:ENABle**
**:LIMits:BER:CH1:UPPer:ENABle?**

| | |
|---|---|
| **Description:** | Set command Enables/Disables Upper Limit for Bit Error Rate measurement. |
| | Query command returns parameter setting. |
| **Parameter:** | OFF \| ON \| 0 \| 1 |
| **Default Value:** | OFF |
| **Set/Query Format:** | Boolean |
| **Example:** | :LIMits:BER:CH1:UPPer:ENABle ON |
| | Enables Upper Limit for Bit Error Rate measurement. |
| **Query Response:** | :LIMits:BER:CH1:UPPer:ENABle? |
| | 1 |

### 4.3.9 Bit Error Rate - Upper Limit Value

**:LIMits:BER:CH1:UPPer:VALue**
**:LIMits:BER:CH1:UPPer:VALue?**

| | |
|---|---|
| **Description:** | Set command defines Upper Limit Value for Bit Error Rate measurement. |
| | Query command returns parameter setting. |
| **Range:** | 0.0 to 100.0% |
| **Units:** | % (percent) |
| **Default Value:** | 0.0% |
| **Set/Query Format:** | NRf \| NR2 |
| **Example:** | :LIMits:BER:CH1:UPPer:VALue 5 |
| | Sets Upper Limit Value for Bit Error Rate measurements to 5%. |
| **Query Response:** | :LIMits:BER:CH1:UPPer:VALue? |
| | 5.0000000000 |

## 4.4　　　BROADBAND POWER

### 4.4.1　　　Broadband Power - Averages

**:CONFigure:RF:ANALyzer:TRBPower:AVERage**
**:CONFigure:RF:ANALyzer:TRBPower:AVERage?**

| | |
|---|---|
| **Description:** | Set command defines number of readings taken to calculate Average Broadband Power measurement. |
| | Query command returns parameter setting. |
| **Range:** | 1 to 250 |
| **Default Value:** | 1 |
| **Set/Query Format:** | NR1 |
| **Example:** | :CONFigure:RF:ANALyzer:TRBPower:AVERage 25 |
| | Sets number of readings taken to calculate Average Broadband Power measurement to 25. |
| **Query Response:** | :CONFigure:RF:ANALyzer:TRBPower:AVERage? |
| | 25 |

### 4.4.2　　　Broadband Power - Lower Limit Enable

**:LIMits:RF:TRBPower:LOWer:ENABle**
**:LIMits:RF:TRBPower:LOWer:ENABle?**

| | |
|---|---|
| **Description:** | Set command Enables/Disables Lower Limit for Broadband Power measurement. |
| | Query command returns parameter setting. |
| **Parameter:** | OFF \| ON \| 0 \| 1 |
| **Default Value:** | OFF |
| **Set/Query Format:** | Boolean |
| **Example:** | :LIMits:RF:TRBPower:LOWer:ENABle ON |
| | Enables Lower Limit for Broadband Power measurement. |
| **Query Response:** | :LIMits:RF:TRBPower:LOWer:ENABle? |
| | 1 |

### 4.4.3　　　Broadband Power - Lower Limit Value

**:LIMits:RF:TRBPower:LOWer:VALue**
**:LIMits:RF:TRBPower:LOWer:VALue?**

| | |
|---|---|
| **Description:** | Set command defines Lower Limit Value for Broadband Power measurement. |
| | Query command returns parameter setting. |
| **Range:** | -140.0 to +70.0 dBm |
| **Units:** | mW \| W \| dBW \| dBm |
| **Default Value:** | 100.0 µW |
| **Set/Query Format:** | NRf \| NR2 (W) |
| **Example:** | :LIMits:RF:TRBPower:LOWer:VALue -45dBm |
| | Sets Lower Limit Value for Broadband measurement to -45.0 dBm. |
| **Query Response:** | :LIMits:RF:TRBPower:LOWer:VALue? |
| | 0.0 |

### 4.4.4 Broadband Power - Measurement Query

**:FETCh:RF:ANALyzer:TRBPower? <units>**

| | |
|---|---|
| **Description:** | Command returns Broadband Power measurement data. |
| **Query Data:** | <statusbyte>,<failbyte>,<avgcount>,<avg> |

| NOTE | Refer to Chapter 1 for UUT Measurement Meter Return Data. |
|---|---|

| | |
|---|---|
| **Units:** | W \| dBW \| dBM |
| **Query Response:** | :FETCh:RF:ANALyzer:TRBPower? DBW |
| | 1,5,1,0.0013 |

| NOTE | RF Input must be set to TR to return valid data. |
|---|---|

### 4.4.5 Broadband Power - Peak Measurement Query

**:FETCh:RF:ANALyzer:TRBPower:HOLD?**

| | |
|---|---|
| **Description:** | Command returns Peak Broadband Power measurement data. |
| **Query Data:** | <statusbyte>,<failbyte>,<avgcount>,<avg> |

| NOTE | Refer to Chapter 1 for UUT Measurement Meter Return Data. |
|---|---|

| | |
|---|---|
| **Units:** | W \| dBW \| dBM |
| **Query Response:** | :FETCh:RF:ANALyzer:TRBPower:HOLD? |
| | 1,5,0.0091 |

| NOTE | RF Input must be set to TR to return valid data. |
|---|---|

### 4.4.6 Broadband Power - Units

**:CONFigure:RF:ANALyzer:TRBPower:UNIts**
**:CONFigure:RF:ANALyzer:TRBPower:UNIts?**

| | |
|---|---|
| **Description:** | Set command defines the unit of measurement for Broadband Power measurement. |
| | Query command returns parameter setting. |
| **Parameter:** | W \| dBW \| dBm |
| **Default Value:** | W |
| **Set/Query Format:** | CPD \| CRD |
| **Example:** | :CONFigure:RF:ANALyzer:TRBPower:UNIts DBW |
| | Displays Broadband Power measurement in dBW. |
| **Query Response:** | :CONFigure:RF:ANALyzer:TRBPower:UNIts? |
| | DBW |

## 4.4.7       Broadband Power - Upper Limit Enable

**:LIMits:RF:TRBPower:UPPer:ENABle**
**:LIMits:RF:TRBPower:UPPer:ENABle?**

|  |  |
|---|---|
| **Description:** | Set command Enables/Disables Upper Limit for Broadband Power measurement. |
|  | Query command returns parameter setting. |
| **Parameter:** | OFF \| ON \| 0 \| 1 |
| **Default Value:** | OFF |
| **Set/Query Format:** | Boolean |
| **Example:** | :LIMits:RF:TRBPower:UPPer:ENABle ON |
|  | Enables Upper Limit for Broadband Power measurement. |
| **Query Response:** | :LIMits:RF:TRBPower:UPPer:ENABle? |
|  | 1 |

## 4.4.8       Broadband Power - Upper Limit Value

**:LIMits:RF:TRBPower:UPPer:VALue**
**:LIMits:RF:TRBPower:UPPer:VALue?**

|  |  |
|---|---|
| **Description:** | Set command defines Upper Limit Value for Broadband Power measurement. |
|  | Query command returns parameter setting. |
| **Range:** | -140.0 to +70.0 dBm |
| **Units:** | mW \| W \| dBW \| dBm |
| **Default Value:** | 100.0 µW |
| **Set/Query Format:** | NRf \| NR2 (W) |
| **Example:** | :LIMits:RF:TRBPower:UPPer:VALue -25dBm |
|  | Sets Upper Limit Value for Broadband Power measurement to -25.0 dBm. |
| **Query Response:** | :LIMits:RF:TRBPower:UPPer:VALue? |
|  | 0.0 |

## 4.5 FREQUENCY CORRECTION

### 4.5.1 Frequency Error - Average

**:METERs:FCR:CH1:AVERaging**
**:METERs:FCR:CH1:AVERaging?**

| | |
|---|---|
| **Description:** | Set command defines the number of readings taken to calculate Average Frequency Error measurement. |
| | Query command returns parameter setting. |
| **Range:** | 1 to 250 |
| **Default Value:** | 1 |
| **Set/Query Format:** | NR1 |
| **Example:** | :METERs:FCR:CH1:AVERaging 100 |
| | Sets the number of readings taken to calculate Average Frequency Error measurement to 100. |
| **Query Response:** | :METERs:FCR:CH1:AVERaging? |
| | 100 |

### 4.5.2 Frequency Error - Average Measurement Reset

**:METERs:FCR:CH1:CLEAR:AVG**

| | |
|---|---|
| **Description:** | Command clears and resets Average Frequency Correction measurement. |
| **Parameter/Query:** | none |

### 4.5.3 Frequency Error - Lower Limit Enable

**:LIMits:FCR:CH1:LOWer:ENABle**
**:LIMits:FCR:CH1:LOWer:ENABle?**

| | |
|---|---|
| **Description:** | Set command Enables/Disables Lower Limit for Frequency Correction measurement. |
| | Query command returns parameter setting. |
| **Parameter:** | OFF | ON | 0 | 1 |
| **Default Value:** | OFF |
| **Set/Query Format:** | Boolean |
| **Example:** | :LIMits:FCR:CH1:LOWer:ENABle ON |
| | Enables Lower Limit for Frequency Correction measurement. |
| **Query Response:** | :LIMits:FCR:CH1:LOWer:ENABle? |
| | 1 |

### 4.5.4 Frequency Error - Lower Limit Value

**:LIMits:FCR:CH1:LOWer:VALue**
**:LIMits:FCR:CH1:LOWer:VALue?**

| | |
|---|---|
| **Description:** | Set command defines Lower Limit Value for Frequency Correction measurement. |
| | Query command returns parameter setting. |
| **Range:** | -2000.0 to +2000.0 Hz |
| **Units:** | Hz |
| **Default Value:** | 0.0 Hz |
| **Set/Query Format:** | NRf | NR2 |
| **Example:** | :LIMits:FCR:CH1:LOWer:VALue 250Hz |
| | Sets Lower Limit Value for Frequency Correction measurement to 250.0 Hz. |
| **Query Response:** | :LIMits:FCR:CH1:LOWer:VALue? |
| | 250.00 |

### 4.5.5 Frequency Error - Measurement Query

**:METERs:FCR:CH1:STATus?**

| | |
|---|---|
| **Description:** | Command returns Frequency Error measurement data. |
| **Query Data:** | <statusbyte>,<failbyte>,<precision>,<percentage>,<avg>,<max>,<min>,<units> |

| NOTE | Refer to Chapter 1 for UUT Measurement Meter return data. |
|---|---|

| | |
|---|---|
| **Query Response:** | :METERs:FCR:CH1:STATus? |
| | 0,0,3 100.00, -0.044, 0.204, -16.907,2 |

### 4.5.6 Frequency Error - Peak Measurement Reset

**:METERs:FCR:CH1:CLEAR:PEAK**

| | |
|---|---|
| **Description:** | Command clears and resets Peak Frequency Correction measurement. |
| **Parameter/Query:** | none |

### 4.5.7 Frequency Error - Upper Limit Enable

**:LIMits:FCR:CH1:UPPer:ENABle**
**:LIMits:FCR:CH1:UPPer:ENABle?**

| | |
|---|---|
| **Description:** | Set command Enables/Disables Upper Limit for Frequency Correction measurement. |
| | Query command returns parameter setting. |
| **Parameter:** | OFF | ON | 0 | 1 |
| **Default Value:** | OFF |
| **Set/Query Format:** | Boolean |
| **Example:** | :LIMits:FCR:CH1:UPPer:ENABle ON |
| | Enables Upper Limit for Frequency Correction measurement. |
| **Query Response:** | :LIMits:FCR:CH1:UPPer:ENABle? |
| | 1 |

## 4.5.8 Frequency Error - Upper Limit Value

**:LIMits:FCR:CH1:UPPer:VALue**
**:LIMits:FCR:CH1:UPPer:VALue?**

| | |
|---|---|
| **Description:** | Set command defines Upper Limit Value for Frequency Correction measurement. |
| | Query command returns parameter setting. |
| **Range:** | -2000.0 to +2000.0 Hz |
| **Units:** | Hz |
| **Default Value:** | 0.0 Hz |
| **Set/Query Format:** | NRf \| NR2 |
| **Example:** | :LIMits:FCR:CH1:UPPer:VALue 500Hz |
| | Sets Upper Limit Value for Frequency Correction measurements to 500.0 Hz. |
| **Query Response:** | :LIMits:FCR:CH1:UPPer:VALue? |
| | 500.00 |

## 4.6      FSK ERROR

### 4.6.1      FSK Error - Averages

**:METERs:FSKERR:CH1:AVERaging**
**:METERs:FSKERR:CH1:AVERaging?**

|  |  |
|---|---|
| **Description:** | Set command defines number of readings taken to calculate Average FSK Error measurement. |
| | Query command returns parameter setting. |
| **Range:** | 1 to 250 |
| **Default Value:** | 1 |
| **Set/Query Format:** | NR1 |
| **Example:** | :METERs:FSKERR:CH1:AVERaging 100 |
| | Sets the number of readings taken to calculate Average FSK Error measurement to 100. |
| **Query Response:** | :METERs:FSKERR:CH1:AVERaging? |
| | 100 |

### 4.6.2      FSK Error - Average Measurement Reset

**:METERs:FSKERR:CH1:CLEAR:AVG**

|  |  |
|---|---|
| **Description:** | Command clears and resets Average FSK Error measurement. |
| **Parameter/Query:** | none |

### 4.6.3      FSK Error - Lower Limit Enable

**:LIMits:FSKERR:CH1:LOWer:ENABle**
**:LIMits:FSKERR:CH1:LOWer:ENABle?**

|  |  |
|---|---|
| **Description:** | Set command Enables/Disables Lower Limit for FSK Error measurement. |
| | Query command returns parameter setting. |
| **Parameter:** | OFF \| ON \| 0 \| 1 |
| **Default Value:** | OFF |
| **Set/Query Format:** | Boolean |
| **Example:** | :LIMits:FSKERR:CH1:LOWer:ENABle ON |
| | Enables Lower Limit for FSK Error measurement. |
| **Query Response:** | :LIMits:FSKERR:CH1:LOWer:ENABle? |
| | 1 |

### 4.6.4 FSK Error - Lower Limit Value

**:LIMits:FSKERR:CH1:LOWer:VALue**
**:LIMits:FSKERR:CH1:LOWer:VALue?**

| | |
|---|---|
| **Description:** | Set command defines Lower Limit Value for FSK Error measurement. |
| | Query command returns parameter setting. |
| **Range:** | 0.0 to 200.0% |
| **Units:** | % (percent) |
| **Default Value:** | 0.0% |
| **Set/Query Format:** | NRf \| NR2 |
| **Example:** | :LIMits:FSKERR:CH1:LOWer:VALue 100 |
| | Sets Lower Limit Value for FSK Error measurement to 100.0%. |
| **Query Response:** | :LIMits:FSKERR:CH1:LOWer:VALue? |
| | 100.00 |

### 4.6.5 FSK Error - Measurement Type

**:METERs:FSKERR:CH1:MODE**
**:METERs:FSKERR:CH1:MODE?**

| | |
|---|---|
| **Description:** | Set command defines FSK Error measurement type. |
| | Query command returns parameter setting. |
| **Parameter:** | PEAK \| AVERage |
| **Default Value:** | PEAK |
| **Set/Query Format:** | CPD \| CRD |
| **Example:** | :METERs:FSKERR:CH1:MODE AVERage |
| | Sets FSK Error measurement to Average. |
| **Query Response:** | :METERs:FSKERR:CH1:MODE? |
| | AVER |

### 4.6.6 FSK Error - Measurement Query

**:METERs:FSKERR:CH1:STATus?**

| | |
|---|---|
| **Description:** | Command returns FSK Error measurement data. |
| **Query Data:** | <statusbyte>,<failbyte>,<precision>,<percentage>,<avg>,<max>,<min>,<units> |

| NOTE | Refer to Chapter 1 for UUT Measurement Meter return data. |
|---|---|

| | |
|---|---|
| **Query Response:** | :METERs:FSKERR:CH1:STATus? |
| | 0,0,3, 100.000, 0.581, 113.982, 0.000,1 |

### 4.6.7 FSK Error - Peak Measurement Reset

**:METERs:FSKERR:CH1:CLEAR:PEAK**

| | |
|---|---|
| **Description:** | Command clears and resets Peak FSK Error measurement. |
| **Parameter/Query:** | none |

## 4.6.8    FSK Error - Upper Limit Enable

**:LIMits:FSKERR:CH1:UPPer:ENABle**
**:LIMits:FSKERR:CH1:UPPer:ENABle?**

| | |
|---|---|
| **Description:** | Set command Enables/Disables Upper Limit for FSK Error measurement. |
| | Query command returns parameter setting. |
| **Parameter:** | OFF \| ON \| 0 \| 1 |
| **Default Value:** | OFF |
| **Set/Query Format:** | Boolean |
| **Example:** | :LIMits:FSKERR:CH1:UPPer:ENABle ON |
| | Enables Upper Limit for FSK Error measurement. |
| **Query Response:** | :LIMits:FSKERR:CH1:UPPer:ENABle? |
| | 1 |

## 4.6.9    FSK Error - Upper Limit Value

**:LIMits:FSKERR:CH1:UPPer:VALue**
**:LIMits:FSKERR:CH1:UPPer:VALue?**

| | |
|---|---|
| **Description:** | Set command defines Upper Limit Value for FSK Error measurement. |
| | Query command returns parameter setting. |
| **Range:** | 0.0 to 200.0% |
| **Units:** | % (percent) |
| **Default Value:** | 0.0% |
| **Set/Query Format:** | NRf \| NR2 |
| **Example:** | :LIMits:FSKERR:CH1:UPPer:VALue 100 |
| | Sets Upper Limit Value for FSK Error measurement to 100.0%. |
| **Query Response:** | :LIMits:FSKERR:CH1:UPPer:VALue? |
| | 100.00 |

## 4.7        INBAND POWER

### 4.7.1        Inband Power - Averages

**:METERs:POWer:CHn:INBand:AVERaging**
**:METERs:POWer:CHn:INBand:AVERaging?**

| | |
|---|---|
| **Description:** | Set command defines number of readings taken to calculate Average Inband Power measurement. |
| | Query command returns parameter setting. |
| **Range:** | 1 to 250 |
| **Default Value:** | 1 |
| **Set/Query Format:** | NR1 |
| **Example:** | :METERs:POWer:CH1:INBand:AVERaging 100 |
| | Sets the number of readings taken to calculate Channel 1 Inband Power measurements to 100. |
| **Query Response:** | :METERs:POWer:CH1:INBand:AVERaging? |
| | 100 |

> **NOTE**  CHn = 1 or 2 (Channel 1 or 2).  Channel 2 is option enabled.

### 4.7.2        Inband Power - Average Measurement Reset

**:METERs:POWer:CHn:INBand:CLEAR:AVG**

| | |
|---|---|
| **Description:** | Command clears and resets Average Inband Power measurement. |
| **Parameter/Query:** | none |

> **NOTE**  CHn = 1 or 2 (Channel 1 or 2).  Channel 2 is option enabled.

### 4.7.3        Inband Power - Lower Limit Enable

**:LIMits:POWer:CHn:INBand:LOWer:ENABle**
**:LIMits:POWer:CHn:INBand:LOWer:ENABle?**

| | |
|---|---|
| **Description:** | Set command Enables/Disables Lower Limit for Inband Power measurement. |
| | Query command returns parameter setting. |
| **Parameter:** | OFF | ON | 0 | 1 |
| **Default Value:** | OFF |
| **Set/Query Format:** | Boolean |
| **Example:** | :LIMits:POWer:CH1:INBand:LOWer:ENABle ON |
| | Enables Lower Limit for Channel 1 Inband Power measurement. |
| **Query Response:** | :LIMits:POWer:CH1:INBand:LOWer:ENABle? |
| | 1 |

> **NOTE**  CHn = 1 or 2 (Channel 1 or 2).  Channel 2 is option enabled.

### 4.7.4        Inband Power - Lower Limit Value

**:LIMits:POWer:CHn:INBand:LOWer:VALue**
**:LIMits:POWer:CHn:INBand:LOWer:VALue?**

| | |
|---|---|
| **Description:** | Set command defines Lower Limit Value for Inband Power measurement. |
| | Query command returns parameter setting. |
| **Range:** | -140.0 to +70.0 dBm |
| **Units:** | W \| dBW \| dBm \| V \| dBμV |
| **Default Value:** | 0.0 dBm |
| **Set/Query Format:** | NRf \| NR2 |
| **Example:** | :LIMits:POWer:CH1:INBand:LOWer:VALue -45dBm |
| | Sets Lower Limit for Channel 1 Inband measurements to -45.0 dBm. |
| **Query Response:** | :LIMits:POWer:CH1:INBand:LOWer:VALue? |
| | 0.0 |

NOTE   CHn = 1 or 2 (Channel 1 or 2).  Channel 2 is option enabled.

### 4.7.5        Inband Power - Measurement Query

**:METERs:POWer:CHn:INBand:STATus?**

| | |
|---|---|
| **Description:** | Command returns Inband Power measurement data. |
| **Query Data:** | <statusbyte>,<failbyte>,<precision>,<percentage>,<avg>,<max>,<min>,<units> |

NOTE   Refer to Chapter 1 for UUT Measurement Meter Return Data.

| | |
|---|---|
| **Query Response:** | :METERs:POWer:CH1:INBand:STATus? |
| | 0,0,3 100.00, -30.183, -30.140, -30.241,6 |

NOTE   CHn = 1 or 2 (Channel 1 or 2).  Channel 2 is option enabled.
Protocol must be defined as ANALOG to return valid measurement data.

### 4.7.6        Inband Power - Peak Measurement Reset

**:METERs:POWer:CHn:INBand:CLEAR:PEAK**

| | |
|---|---|
| **Description:** | Command clears and resets Peak Inband Power measurement. |
| **Parameter/Query:** | none |

NOTE   CHn = 1 or 2 (Channel 1 or 2).  Channel 2 is option enabled.

### 4.7.7 Inband Power - Units

**:METERs:POWer:INBand:UNIts**
**:METERs:POWer:INBand:UNIts?**

| | |
|---|---|
| **Description:** | Set command defines the unit of measurement for Inband Power measurement. |
| | Query command returns parameter setting. |
| **Parameter:** | dBm \| W \| dBW \| V \| dBµV |
| **Default Value:** | dBm |
| **Set/Query Format:** | CPD \| CRD |
| **Example:** | :METERs:POWer:INBand:UNIts W |
| | Displays Inband Power measurements in Watts. |
| **Query Response:** | :METERs:POWer:INBand:UNIts? |
| | W |

### 4.7.8 Inband Power - Upper Limit Enable

**:LIMits:POWer:CHn:INBand:UPPer:ENABle**
**:LIMits:POWer:CHn:INBand:UPPer:ENABle?**

| | |
|---|---|
| **Description:** | Set command Enables/Disables Upper Limit for Inband Power measurement. |
| | Query command returns parameter setting. |
| **Parameter:** | OFF \| ON \| 0 \| 1 |
| **Set/Query Format:** | Boolean |
| **Default Value:** | OFF |
| **Example:** | :LIMits:POWer:CH1:INBand:UPPer:ENABle ON |
| | Enables Upper Limit for Channel 1 Inband Power measurement. |
| **Query Response:** | :LIMits:POWer:CH1:INBand:UPPer:ENABle? |
| | 1 |

| NOTE | CHn = 1 or 2 (Channel 1 or 2).  Channel 2 is option enabled. |
|---|---|

### 4.7.9 Inband Power - Upper Limit Value

**:LIMits:POWer:CHn:INBand:UPPer:VALue**
**:LIMits:POWer:CHn:INBand:UPPer:VALue?**

| | |
|---|---|
| **Description:** | Set command defines the Upper Limit Value for Inband Power measurement Upper. |
| | Query command returns parameter setting. |
| **Range:** | -140.0 to +70.0 dBm |
| **Units:** | W \| dBW \| dBm \| V \| dBµV |
| **Default Value:** | 0.0 dBm |
| **Set/Query Format:** | NRf \| NR2 |
| **Example:** | :LIMits:POWer:CH1:INBand:UPPer:VALue -25dBm |
| | Sets Upper Limit for Channel 1 Inband Power Measurement to -25.0 dBm. |
| **Query Response:** | :LIMits:POWer:CH1:INBand:UPPer:VALue? |
| | 0.0 |

| NOTE | CHn = 1 or 2 (Channel 1 or 2).  Channel 2 is option enabled. |
|---|---|

## 4.8      SIGNAL POWER

### 4.8.1      Signal Power - Averages

**:METERs:POWer:CH1:AVERaging**
**:METERs:POWer:CH1:AVERaging?**

| | |
|---|---|
| **Description:** | Set command defines the number of readings taken to calculate Average Signal Power measurement. |
| | Query command returns parameter setting. |
| **Range:** | 1 to 250 |
| **Default Value:** | 1 |
| **Set/Query Format:** | NR1 |
| **Example:** | :METERs:POWer:CH1:AVERaging 100 |
| | Sets the number of readings taken to calculate Average Signal Power measurement to 100. |
| **Query Response:** | :METERs:POWer:CH1:AVERaging? |
| | 100 |

### 4.8.2      Signal Power - Average Measurement Reset

**:METERs:POWer:CH1:CLEAR:AVG**

| | |
|---|---|
| **Description:** | Command clears and resets Average Signal Power measurement. |
| **Parameter/Query:** | none |

### 4.8.3      Signal Power - Lower Limit Enable

**:LIMits:POWer:CH1:LOWer:ENABle**
**:LIMits:POWer:CH1:LOWer:ENABle?**

| | |
|---|---|
| **Description:** | Set command Enables/Disables Lower Limit for Signal Power measurement. |
| | Query command returns parameter setting. |
| **Parameter:** | OFF \| ON \| 0 \| 1 |
| **Default Value:** | OFF |
| **Set/Query Format:** | Boolean |
| **Example:** | :LIMits:POWer:CH1:LOWer:ENABle ON |
| | Enables Lower Limit for Signal Power measurement. |
| **Query Response:** | :LIMits:POWer:CH1:LOWer:ENABle? |
| | 1 |

### 4.8.4 Signal Power - Lower Limit Value

**:LIMits:POWer:CH1:LOWer:VALue**
**:LIMits:POWer:CH1:LOWer:VALue?**

| | |
|---|---|
| **Description:** | Set command defines Lower Limit Value for Signal Power measurement. |
| | Query command returns parameter setting. |
| **Range:** | -140.0 to +70.0 dBm |
| **Units:** | dBm |
| **Default Value:** | 0.0 dBm |
| **Set/Query Format:** | NRf \| NR2 |
| **Example:** | :LIMits:POWer:CH1:LOWer:VALue -90dBm |
| | Sets Lower Limit Value for Signal Power measurement to -90.0 dBm. |
| **Query Response:** | :LIMits:POWer:CH1:LOWer:VALue? |
| | -90.00 |

### 4.8.5 Signal Power - Measurement Type

**:METERs:POWer:TYPE**
**:METERs:POWer:TYPE?**

| | |
|---|---|
| **Description:** | Set command defines Signal Power measurement type. |
| | Query command returns parameter setting. |
| **Parameter:** | AVER \| MAX \| MIN |
| **Default Value:** | PEAK |
| **Set/Query Format:** | CPD \| CRD |
| **Example:** | :METERs:POWer:TYPE AVER |
| | Sets Signal Power measurement to Average. |
| **Query Response:** | :METERs:POWer:TYPE? |
| | AVER |

### 4.8.6 Signal Power - Measurement Query

**:METERs:POWer:CH1:STATus?**

| | |
|---|---|
| **Description:** | Command returns Signal Power measurement data. |
| **Query Data:** | \<statusbyte>,\<failbyte>,\<precision>,\<percentage>,\<avg>,\<max>,\<min>,\<units> |
| NOTE | Refer to Chapter 1 for UUT Measurement Meter return data. |
| **Query Response:** | :METERs:POWer:CH1:STATus? |
| | 0,0,3 100.00, -30.183, -30.140, -30.241,6 |

### 4.8.7 Signal Power - Peak Measurement Reset

**:METERs:POWer:CH1:CLEAR:PEAK**

| | |
|---|---|
| **Description:** | Command clears and resets Peak Signal Power measurement. |
| **Parameter/Query:** | none |

### 4.8.8 Signal Power - Units

**:METERs:POWer:UNIts**
**:METERs:POWer:UNIts?**

| | |
|---|---|
| **Description:** | Set command defines the unit of measurement for Signal Power measurement. Query command returns parameter setting. |
| **Parameter:** | dBm \| W \| dBW \| V \| dBµV |
| **Default Value:** | dBm |
| **Set/Query Format:** | CPD \| CRD |
| **Example:** | :METERs:POWer:UNIts W |
| | Displays Signal Power measurement in Watts. |
| **Query Response:** | :METERs:POWer:UNIts? |
| | W |

### 4.8.9 Signal Power - Upper Limit Enable

**:LIMits:POWer:CH1:UPPer:ENABle**
**:LIMits:POWer:CH1:UPPer:ENABle?**

| | |
|---|---|
| **Description:** | Set command Enables/Disables Upper Limit for Signal Power measurement. Query command returns parameter setting. |
| **Parameter:** | OFF \| ON \| 0 \| 1 |
| **Default Value:** | OFF |
| **Set/Query Format:** | Boolean |
| **Example:** | :LIMits:POWer:CH1:UPPer:ENABle ON |
| | Enables Upper Limit for Signal Power measurement. |
| **Query Response:** | :LIMits:POWer:CH1:UPPer:ENABle? |
| | 1 |

### 4.8.10 Signal Power - Upper Limit Value

**:LIMits:POWer:CH1:UPPer:VALue**
**:LIMits:POWer:CH1:UPPer:VALue?**

| | |
|---|---|
| **Description:** | Set command defines Upper Limit Value for Signal Power measurement. Query command returns parameter setting. |
| **Range:** | -140.0 to +70.0 dBm |
| **Units:** | dBm |
| **Default Value:** | 0.0 dBm |
| **Set/Query Format:** | NRf \| NR2 |
| **Example:** | :LIMits:POWer:CH1:UPPer:VALue -80dBm |
| | Sets Upper Limit Value for Signal Power measurements to -80.0 dBm. |
| **Query Response:** | :LIMits:POWer:CH1:UPPer:VALue? |
| | -80.00 |

## 4.9         SYMBOL CLOCK ERROR

### 4.9.1         Symbol Clock Error - Averages

**:METERs:SCE:CH1:AVERaging**
**:METERs:SCE:CH1:AVERaging?**

| | |
|---|---|
| **Description:** | Set command defines the number of readings taken to calculate Average Symbol Clock Error measurement. |
| | Query command returns parameter setting. |
| **Range:** | 1 to 250 |
| **Default Value:** | 1 |
| **Set/Query Format:** | NR1 |
| **Example:** | :METERs:SCE:CH1:AVERaging 100 |
| | Sets the number of readings taken to calculate Average Symbol Clock Error measurement to 100. |
| **Query Response:** | :METERs:SCE:CH1:AVERaging? |
| | 100 |

### 4.9.2         Symbol Clock Error - Average Measurement Reset

**:METERs:SCE:CH1:CLEAR:AVG**

| | |
|---|---|
| **Description:** | Command clears and resets Average Symbol Clock Error measurement. |
| **Parameter/Query:** | none |

### 4.9.3         Symbol Clock Error - Lower Limit Enable

**:LIMits:SCE:CH1:LOWer:ENABle**
**:LIMits:SCE:CH1:LOWer:ENABle?**

| | |
|---|---|
| **Description:** | Set command Enables/Disables Lower Limit for Symbol Clock Error measurement. |
| | Query command returns parameter setting. |
| **Parameter:** | OFF \| ON \| 0 \| 1 |
| **Default Value:** | OFF |
| **Set/Query Format:** | Boolean |
| **Example:** | :LIMits:SCE:CH1:LOWer:ENABle ON |
| | Enables Lower Limit for Symbol Clock Error measurement. |
| **Query Response:** | :LIMits:SCE:CH1:LOWer:ENABle? |
| | 1 |

### 4.9.4 Symbol Clock Error - Lower Limit Value

**:LIMits:SCE:CH1:LOWer:VALue**
**:LIMits:SCE:CH1:LOWer:VALue?**

| | |
|---|---|
| **Description:** | Set command defines Lower Limit Value for Symbol Clock Error measurement. Query command returns parameter setting. |
| **Range:** | 0.0 to +1000.0 mHz |
| **Units:** | mHz |
| **Default Value:** | 0.0 mHz |
| **Set/Query Format:** | NRf \| NR2 |
| **Example:** | :LIMits:SCE:CH1:LOWer:VALue -500mHz |
| | Sets Lower Limit Value for Symbol Clock Error measurement to -500.0 mHz. |
| **Query Response:** | :LIMits:SCE:CH1:LOWer:VALue? |
| | -500.00 |

### 4.9.5 Symbol Clock Error - Measurement Query

**:METERs:SCE:CH1:STATus?**

| | |
|---|---|
| **Description:** | Command returns Symbol Clock Error measurement data. |
| **Query Data:** | &lt;statusbyte&gt;,&lt;failbyte&gt;,&lt;precision&gt;,&lt;percentage&gt;,&lt;avg&gt;,&lt;max&gt;,&lt;min&gt;,&lt;units&gt; |

NOTE Refer to Chapter 1 for UUT Measurement Meter return data.

| | |
|---|---|
| **Query Response:** | :METERs:SCE:CH1:STATus? |
| | 0,0,3 100.00, -2.487, -0.346, -6.642,18 |

### 4.9.6 Symbol Clock Error - Peak Measurement Reset

**:METERs:SCE:CH1:CLEAR:PEAK**

| | |
|---|---|
| **Description:** | Command clears and resets Peak Symbol Clock Error measurement. |
| **Parameter/Query:** | none |

### 4.9.7 Symbol Clock Error - Units

**:METERs:SCE:UNIts**
**:METERs:SCE:UNIts?**

| | |
|---|---|
| **Description:** | Set command defines the unit of measurement for Symbol Clock Error measurement. Query command returns parameter setting. |
| **Parameter:** | Hz \| PPM |
| **Default Value:** | Hz |
| **Set/Query Format:** | CPD \| CRD |
| **Example:** | :METERs:SCE:UNIts PPM |
| | Displays Symbol Clock Error measurement in PPM. |
| **Query Response:** | :METERs:SCE:UNIts? |
| | PPM |

### 4.9.8　　　　Symbol Clock Error - Upper Limit Enable

**:LIMits:SCE:CH1:UPPer:ENABle**
**:LIMits:SCE:CH1:UPPer:ENABle?**

| | |
|---:|:---|
| **Description:** | Set command Enables/Disables Upper Limit for Symbol Clock Error measurement. |
| | Query command returns parameter setting. |
| **Parameter:** | OFF \| ON \| 0 \| 1 |
| **Default Value:** | OFF |
| **Set/Query Format:** | Boolean |
| **Example:** | :LIMits:SCE:CH1:UPPer:ENABle ON |
| | Enables Upper Limit for Symbol Clock Error measurement. |
| **Query Response:** | :LIMits:SCE:CH1:UPPer:ENABle? |
| | 1 |

### 4.9.9　　　　Symbol Clock Error - Upper Limit Value

**:LIMits:SCE:CH1:UPPer:VALue**
**:LIMits:SCE:CH1:UPPer:VALue?**

| | |
|---:|:---|
| **Description:** | Set command defines Upper Limit Value for Symbol Clock Error measurement. |
| | Query command returns parameter setting. |
| **Range:** | 0.0 to +1000.0 mHz |
| **Units:** | mHz |
| **Default Value:** | 0.0 mHz |
| **Set/Query Format:** | NRf \| NR2 |
| **Example:** | :LIMits:SCE:CH1:UPPer:VALue 500mHz |
| | Sets Upper Limit Value for Symbol Clock Error measurement to 500.0 mHz. |
| **Query Response:** | :LIMits:SCE:CH1:UPPer:VALue? |
| | 500.00 |

## 4.10 SYMBOL DEVIATION

### 4.10.1 Symbol Deviation - Averages

**:METERs:SYMdev:CH1:AVERaging**
**:METERs:SYMdev:CH1:AVERaging?**

| | |
|---|---|
| **Description:** | Set command defines the number of readings taken to calculate Average Symbol Deviation measurement. |
| | Query command returns parameter setting. |
| **Range:** | 1 to 250 |
| **Default Value:** | 1 |
| **Set/Query Format:** | NR1 |
| **Example:** | :METERs:SYMdev:CH1:AVERaging 100 |
| | Sets the number of readings taken to calculate Average Symbol Deviation measurement to 100. |
| **Query Response:** | :METERs:SYMdev:CH1:AVERaging? |
| | 100 |

### 4.10.2 Symbol Deviation - Average Measurement Reset

**:METERs:SYMdev:CH1:CLEAR:AVG**

| | |
|---|---|
| **Description:** | Command clears and resets Average Symbol Deviation measurement. |
| **Parameter/Query:** | none |

### 4.10.3 Symbol Deviation - Lower Limit Enable

**:LIMits:SYMdev:CH1:LOWer:ENABle**
**:LIMits:SYMdev:CH1:LOWer:ENABle?**

| | |
|---|---|
| **Description:** | Set command Enables/Disables Lower Limit for Symbol Deviation measurement. |
| | Query command returns parameter setting. |
| **Parameter:** | OFF \| ON \| 0 \| 1 |
| **Default Value:** | OFF |
| **Set/Query Format:** | Boolean |
| **Example:** | :LIMits:SYMdev:CH1:LOWer:ENABle ON |
| | Enables Lower Limit for Symbol Deviation measurement. |
| **Query Response:** | :LIMits:SYMdev:CH1:LOWer:ENABle? |
| | 1 |

### 4.10.4      Symbol Deviation - Lower Limit Value

**:LIMits:SYMdev:CH1:LOWer:VALue**
**:LIMits:SYMdev:CH1:LOWer:VALue?**

| | |
|---:|:---|
| **Description:** | Set command defines Lower Limit Value for Symbol Deviation measurement. |
| | Query command returns parameter setting. |
| **Range:** | 0.0 to 10,000.0 Hz |
| **Units:** | Hz |
| **Default Value:** | 0.0 Hz |
| **Set/Query Format:** | NRf | NR2 |
| **Example:** | :LIMits:SYMdev:CH1:LOWer:VALue 250Hz |
| | Sets Lower Limit Value for Symbol Deviation measurement to 250.0 Hz. |
| **Query Response:** | :LIMits:SYMdev:CH1:LOWer:VALue? |
| | 250.00 |

### 4.10.5      Symbol Deviation - Measurement Query

**:METERs:SYMdev:CH1:STATus?**

| | |
|---:|:---|
| **Description:** | Command returns Symbol Deviation measurement data. |
| **Query Data:** | <statusbyte>,<failbyte>,<precision>,<percentage>,<avg>,<max>,<min>,<units> |
| NOTE | Refer to Chapter 1 for UUT Measurement Meter return data. |
| **Query Response:** | :METERs:SYMdev:CH1:STATus? |
| | 0,0,2,100.000,1946.569,2046.316,1800.000,2 |

### 4.10.6      Symbol Deviation - Peak Measurement Reset

**:METERs:SYMdev:CH1:CLEAR:PEAK**

| | |
|---:|:---|
| **Description:** | Command clears and resets Peak Symbol Deviation measurement. |
| **Parameter/Query:** | none |

### 4.10.7      Symbol Deviation - Upper Limit Enable

**:LIMits:SYMdev:CH1:UPPer:ENABle**
**:LIMits:SYMdev:CH1:UPPer:ENABle?**

| | |
|---:|:---|
| **Description:** | Set command Enables/Disables Upper Limit for Symbol Deviation measurement. |
| | Query command returns parameter setting. |
| **Parameter:** | OFF | ON | 0 | 1 |
| **Default Value:** | OFF |
| **Set/Query Format:** | Boolean |
| **Example:** | :LIMits:SYMdev:CH1:UPPer:ENABle ON |
| | Enables Upper Limit for Symbol Deviation measurement. |
| **Query Response:** | :LIMits:SYMdev:CH1:UPPer:ENABle? |
| | 1 |

## 4.10.8     Symbol Deviation - Upper Limit Value

**:LIMits:SYMdev:CH1:UPPer:VALue**
**:LIMits:SYMdev:CH1:UPPer:VALue?**

| | |
|---|---|
| **Description:** | Set command defines Upper Limit Value for Symbol Deviation measurement. Query command returns parameter setting. |
| **Range:** | 0.0 to 10,000.0 Hz |
| **Units:** | Hz |
| **Default Value:** | 0.0 Hz |
| **Set/Query Format:** | NRf \| NR2 |
| **Example:** | :LIMits:SYMdev:CH1:UPPer:VALue 500Hz |
| | Sets Upper Limit Value for Symbol Deviation measurement to 500.0 Hz. |
| **Query Response:** | :LIMits:SYMdev:CH1:UPPer:VALue? |
| | 500.00 |

# Chapter 5 - Audio/Demod Signal
# Rx Meter Remote Commands

## 5.1      INTRODUCTION

This chapter describes the Remote Commands used for configuring and obtaining Audio/Demod signal measurement data. Remote Commands are listed alphabetically by meter name.

## 5.2      ACQUIRE SIGNAL

### 5.2.1      Reset Signal Acquisition

**:RECeive:RESET:ACQuisition**

| | |
|---|---|
| **Description:** | Command resets signal acquisition |
| **Parameter/Query:** | none |

## 5.3      AUDIO MEASUREMENT CONFIGURATION

### 5.3.1      AF Measurements - Audio Source

**:CONFigure:AF:ANALyzer:SOURce**
**:CONFigure:AF:ANALyzer:SOURce?**

| | |
|---|---|
| **Description:** | Set command defines the Source for Audio Frequency Analyzer (Receiver) and Site Sensitivity Search (Option). <br> Query command returns parameter setting. |
| **Parameter:** | AUD1 \| AUD2 \| BAL \| MIC |
| **Default Value:** | AUD1 |
| **Set/Query Format:** | CPD \| CRD |
| **Example:** | :CONFigure:AF:ANALyzer:SOURce MIC <br> Selects Microphone as the Audio Frequency Analyzer (Receiver) Source. |
| **Query Response:** | :CONFigure:AF:ANALyzer:SOURce? <br> MIC |

> **NOTE** Test Set does not process any commands following this one until this command is completed.

## 5.3.2        AF Measurements - Filter Type

**:AF:ANALyzer:MFILter**
**:AF:ANALyzer:MFILter?**

| | |
|---|---|
| **Description:** | Set command selects the Audio Analyzer Post Detection Filter. |
| | Query command returns parameter setting. |
| **Parameter:** | PSOPh \| None \| LP1 \| LP2 \| LP3 \| LP4 \| LP5 \| LP6 \| LP7 \| HP1 \| HP2 \| HP3 \| BP0 \| BP1 \| BP2 \| BP3 \| BP4 \| BP5 \| BP6 \| BP7 \| BP8 \| BP9 \| BP10 \| BP11 \| BP12 \| BP13 \| BP14 \| BP15 \| BP16 |

| | | |
|---|---|---|
| **where:** | NONE = No Filter | BP2 = 0.3 to 5.0 kHz BP |
| | PSOPh = Psoph (CMESS or CCITT) | BP3 = 0.3 to 20.0 kHz BP |
| | LP1 = 300.0 Hz LP | BP4 = 0.3 to 15.0 kHz BP |
| | LP2 = 5.0 kHz LP | BP5 = 20.0 to 300.0 Hz BP |
| | LP3 = 20.0 kHz LP | BP6 = 0.02 to 3.0 kHz BP |
| | LP4 = 15.0 kHz LP | BP7 = 0.02 to 3.4 kHz BP |
| | LP5 = 3.0 kHz LP | BP8 = 0.02 to 5.0 kHz BP |
| | LP6 = 625.0 kHz LP* | BP9 = 0.02 to 15.0 kHz BP |
| | LP7 = 10.0 kHz LP* | BP10 = 0.02 to 20.0 kHz BP |
| | LP8 = 100.0 Hz LP* | BP11 = 0.05 to 300.0 Hz BP |
| | HP1 = 300.0 Hz HP | BP12 = 0.05 to 3.0 kHz BP |
| | HP2 = 20.0 Hz HP | BP13 = 0.05 to 3.4 kHz BP |
| | HP3 = 50.0 Hz HP | BP14 = 0.05 to 5.0 kHz BP |
| | BP0 = 0.3 to 3.0 kHz BP | BP15 = 0.05 to 15.0 kHz BP |
| | BP1 = 0.3 to 3.4 kHz BP | BP16 = 0.05 to 20.0 kHz BP |

| | |
|---|---|
| **Default Value:** | NONE (No Filter) |
| **Set/Query Format:** | CPD \| CRD |
| **Example:** | :AF:ANALyzer:MFILter LP3 |
| | Selects 20.0 kHz Low Pass Filter for AF measurements. |
| **Query Response:** | :AF:ANALyzer:MFILter? |
| | LP3 |

NOTE

Filter selected should be appropriate for signal received from UUT.

When PSOPH is selected, Filter weight is defined using :CONFigure:AF:MFILter command.

Test Set does not process any commands following this one until this command is completed.

*LP6, LP7 and LP8 are used by the Audio Analyzer Tracking Generator and can not be defined by user, but may be returned as query data.

### 5.3.3    AF Measurements - Filter Weight

**:CONFigure:AF:MFILter**
**:CONFigure:AF:MFILter?**

| | |
|---|---|
| **Description:** | Set command defines the weight of psoph filter for AF Analyzer when Psoph filter is selected. |
| | Query command returns parameter setting. |
| **Parameter:** | CMESs \| CCITt |
| **Default Value:** | CMES |
| **Set/Query Format:** | CPD \| CRD |
| **Example:** | :CONFigure:AF:MFILter CCITt |
| | Selects CCITT Psoph Filter for AF measurement. |
| **Query Response:** | :CONFigure:AF:MFILter? |
| | CCIT |

> **NOTE** AF Filter type must be defined as Psoph (:AF:ANALyzer:MFILter PSOPH) for this command to be valid.

### 5.3.4    AF Measurements - Impedance

**:CONFigure:AF:ANALyzer:SOURce:LOAD**
**:CONFigure:AF:ANALyzer:SOURce:LOAD?**

| | |
|---|---|
| **Description:** | Set command defines the Impedance of selected Audio Frequency (Receiver) source. |
| | Query command returns parameter setting. |
| **Parameter:** | UNBHI \| UNB600 |
| **Default Value:** | Audio Source defined |
| **Set/Query Format:** | CPD \| CRD |
| **Example:** | :CONFigure:AF:ANALyzer:SOURce:LOAD UNBHI |
| | Sets Impedance of selected Audio Frequency (Receiver) Source to Unbalanced Hi-Z. |
| **Query Response:** | :CONFigure:AF:ANALyzer:SOURce:LOAD? |
| | UNBHI |

> **NOTE** Command not valid when AF Analyzer Source is set to Balanced (:CONFigure:AF:ANALyzer:SOURce is set to BAL).

### 5.3.5 AF Measurements - Impedance External Load Enable

**:CONFigure:AF:ANALyzer:SOURce:VARiable:LOAD:ENABle**
**:CONFigure:AF:ANALyzer:SOURce:VARiable:LOAD:ENABle?**

| | |
|---|---|
| **Description:** | Set command enables External Load for Impedance. |
| | Query command returns parameter setting. |
| **Parameter:** | OFF \| ON \| 0 \| 1 |
| **Set/Query Format:** | Boolean |
| **Default Value:** | OFF |
| **Example:** | :CONFigure:AF:ANALyzer:SOURce:VARiable:LOAD:ENABle ON |
| | Enables and applies defined External Impedance Load. |
| **Query Response:** | :CONFigure:AF:ANALyzer:SOURce:VARiable:LOAD:ENABle? |
| | 1 |

| NOTE | Command :CONFigure:AF:ANALyzer:SOURce:VARiable:LOAD defines the external load applied when External Load is enabled. |
|---|---|

### 5.3.6 AF Measurements - Impedance External Load

**:CONFigure:AF:ANALyzer:SOURce:VARiable:LOAD**
**:CONFigure:AF:ANALyzer:SOURce:VARiable:LOAD?**

| | |
|---|---|
| **Description:** | Set command defines the Impedance of selected Audio Frequency Analyzer (Receiver) source. |
| | Query command returns parameter setting. |
| **Range:** | 1 to 9999 Ohms |
| **Units:** | Ohms |
| **Default Value:** | 8 Ohms |
| **Set/Query Format:** | NRf \| NR1 |
| **Example:** | :CONFigure:AF:ANALyzer:SOURce:VARiable:LOAD 100OHMS |
| | Sets External Load to 100 Ohms for Audio Frequency Analyzer (Receiver). |
| **Query Response:** | :CONFigure:AF:ANALyzer:SOURce:VARiable:LOAD? |
| | 100 |

| NOTE | Command only valid when Impedance is set to Unbalanced Hi-Z (:CONFigure:AF:ANALyzer:SOURce:LOAD UNBHI). |
|---|---|

### 5.3.7 Loudspeaker

**:CONFigure:PORT:LOUDspeaker**
**:CONFigure:PORT:LOUDspeaker?**

| | |
|---|---|
| **Description:** | Set command selects Loudspeaker port. |
| | Query command returns selected Loudspeaker port. |
| **Parameter:** | OFF \| AUDio \| DEMod |
| **Default Value:** | OFF |
| **Set/Query Format:** | CPD \| CRD |
| **Example:** | :CONFigure:PORT:LOUDspeaker AUDio |
| | Selects Audio as the Loudspeaker port. |
| **Query Response:** | :CONFigure:PORT:LOUDspeaker? |
| | AUD |

## 5.4        MODULATION MEASUREMENT CONFIGURATION

### 5.4.1       Modulation - Filter Type

**:MOD:ANALyzer:MFILter**
**:MOD:ANALyzer:MFILter?**

| | |
|---|---|
| **Description:** | Set command selects the Mod Analyzer Post Detection Filter. |
| | Query command returns parameter setting. |
| **Parameter:** | PSOPh \| None \| LP1 \| LP2 \| LP3 \| LP4 \| LP5 \| LP6 \| LP7 \| HP1 \| HP2 \| HP3 \| BP0 \| BP1 \| BP2 \| BP3 \| BP4 \| BP5 \| BP6 \| BP7 \| BP8 \| BP9 \| BP10 \| BP11 \| BP12 \| BP13 \| BP14 \| BP15 \| BP16 |

| **where:** | | |
|---|---|---|
| NONE = No Filter | BP2 = 0.3 to 5.0 kHz BP |
| PSOPh = Psoph (CMESS or CCITT) | BP3 = 0.3 to 20.0 kHz BP |
| LP1 = 300.0 Hz LP | BP4 = 0.3 to 15.0 kHz BP |
| LP2 = 5.0 kHz LP | BP5 = 20 to 300.0 Hz BP |
| LP3 = 20.0 kHz LP | BP6 = 0.02 to 3.0 kHz BP |
| LP4 = 15.0 kHz LP | BP7 = 0.02 to 3.4 kHz BP |
| LP5 = 3.0 kHz LP | BP8 = 0.02 to 5.0 kHz BP |
| LP6 = 625.0 kHz LP* | BP9 = 0.02 to 15.0 kHz BP |
| LP7 = 10.0 kHz LP* | BP10 = 0.02 to 20.0 kHz BP |
| LP8 = 100.0 Hz LP* | BP11 = 0.05 to 300.0 Hz BP |
| HP1 = 300.0 Hz HP | BP12 = 0.05 to 3.0 kHz BP |
| HP2 = 20.0 Hz HP | BP13 = 0.05 to 3.4 kHz BP |
| HP3 = 50.0 Hz HP | BP14 = 0.05 to 5.0 kHz BP |
| BP0 = 0.3 to 3.0 kHz BP | BP15 = 0.05 to 15.0 kHz BP |
| BP1 = 0.3 to 3.4 kHz BP | BP16 = 0.05 to 20.0 kHz BP |

| | |
|---|---|
| **Default Value:** | NONE (No Filter) |
| **Set/Query Format:** | CPD \| CRD |
| **Example:** | :MOD:ANALyzer:MFILter BP4 |
| | Selects 0.3 to 15.0 kHz band pass filter for receiver signal path. |
| **Query Response:** | :MOD:ANALyzer:MFILter? |
| | BP4 |

> **NOTE**
>
> Filter selected should be appropriate for signal received from UUT.
>
> When PSOPH is selected, Filter weight is defined using :CONFigure:MOD:MFILter command.
>
> Test Set does not process any commands following this one until this command is completed.
>
> *LP6, LP7 and LP8 are used by the Audio Analyzer Tracking Generator and can not be defined by user, but may be returned as query data.

## 5.4.2        Modulation Measurements - Filter Weight

**:CONFigure:MOD:MFILter**
**:CONFigure:MOD:MFILter?**

| | |
|---|---|
| **Description:** | Set command defines the weight of psoph filter for Modulation Analyzer when Psoph filter is selected. |
| | Query command returns parameter setting. |
| **Parameter:** | CMESs \| CCITt |
| **Default Value:** | CMESs |
| **Set/Query Format:** | CPD \| CRD |
| **Example:** | :CONFigure:MOD:MFILter CCITt |
| | Selects CCITT Psoph Filter for modulation measurement. |
| **Query Response:** | :CONFigure:MOD:MFILter? |
| | CCIT |

| NOTE | Filter type must be defined as Psoph (:MOD:ANALyzer:MFILter PSOPH) for this command to be valid. |
|---|---|


## 5.4.3        Function Generator / Demod Out Connector

**:CONFigure:PORT:FGEN**
**:CONFigure:PORT:FGEN?**

| | |
|---|---|
| **Description:** | Set command selects Function Generator / Demod Out Connector. |
| | Query command returns parameter setting. |
| **Parameter:** | FGEN \| AUDio \| DEMod |
| **Default Value:** | FGEN |
| **Set/Query Format:** | CPD \| CRD |
| **Example:** | :CONFigure:PORT:FGEN DEMod |
| | Selects Demod as the Function Generator / Demod Out Connector. |
| **Query Response:** | :CONFigure:PORT:FGEN? |
| | DEM |

## 5.5 AF DISTORTION MEASUREMENTS

### 5.5.1 AF Distortion - Averages

**:CONFigure:AF:ANALyzer:DISTortion:AVERage**
**:CONFigure:AF:ANALyzer:DISTortion:AVERage?**

| | |
|---|---|
| **Description:** | Set command defines the number of readings taken to calculate Average AF Distortion measurement. |
| | Query command returns parameter setting. |
| **Range:** | 1 to 250 |
| **Default Value:** | 1 |
| **Set/Query Format:** | NR1 |
| **Example:** | :CONFigure:AF:ANALyzer:DISTortion:AVERage 75 |
| | Sets number of readings taken to calculate Average AF Distortion measurements to 75. |
| **Query Response:** | :CONFigure:AF:ANALyzer:DISTortion:AVERage? |
| | 75 |

### 5.5.2 AF Distortion - Average Measurement Reset

**:AF:ANALyzer:DISTortion:CLEAR:AVG**

| | |
|---|---|
| **Description:** | Command clears and resets Average AF Distortion measurement. |
| **Parameter/Query:** | none |

### 5.5.3 AF Distortion - Lower Limit Enable

**:LIMits:AF:DISTortion:LOWer:ENABle**
**:LIMits:AF:DISTortion:LOWer:ENABle?**

| | |
|---|---|
| **Description:** | Set command Enables/Disables Lower Limit for AF Distortion measurement. |
| | Query command returns parameter setting. |
| **Parameter:** | OFF \| ON \| 0 \| 1 |
| **Default Value:** | OFF |
| **Set/Query Format:** | Boolean |
| **Example:** | :LIMits:AF:DISTortion:LOWer:ENABle ON |
| | Enables Lower Limit for AF Distortion measurement. |
| **Query Response:** | :LIMits:AF:DISTortion:LOWer:ENABle? |
| | 1 |

### 5.5.4        AF Distortion - Lower Limit Value

**:LIMits:AF:DISTortion:LOWer:VALue**
**:LIMits:AF:DISTortion:LOWer:VALue?**

| | |
|---|---|
| **Description:** | Set command defines the Lower Limit Value for AF Distortion measurement. Query command returns parameter setting. |
| **Range:** | 0.0 to 100.0% |
| **Units:** | % (percent) |
| **Default Value:** | 5.0% |
| **Set/Query Format:** | NRf | NR2 |
| **Example:** | :LIMits:AF:DISTortion:LOWer:VALue 1 |
| | Sets Lower Limit Value for AF Distortion measurement to 1.0%. |
| **Query Response:** | :LIMits:AF:DISTortion:LOWer:VALue? |
| | 1.00 |

### 5.5.5        AF Distortion - Measurement Query

**:FETCh:AF:ANALyzer:DISTortion?**

| | |
|---|---|
| **Description:** | Command returns AF Analyzer Distortion measurement data. |
| **Query Data:** | <statusbyte>,<failbyte>,<avgcount>,<avg%>,<wc%> |

| NOTE | Refer to Chapter 1 for UUT Measurement Meter Return Data. |
|---|---|

| | |
|---|---|
| **Query Response:** | :FETCh:AF:ANALyzer:DISTortion? |
| | 0,0,1,99.97,99.99 |

| NOTE | Protocol must be set to Analog to return valid AF Distortion measurement data. |
|---|---|

### 5.5.6        AF Distortion - Peak Measurement Reset

**:AF:ANALyzer:DISTortion:CLEAR:PEAK**

| | |
|---|---|
| **Description:** | Command clears and resets Peak AF Distortion measurement. |
| **Parameter/Query:** | none |

### 5.5.7        AF Distortion - Upper Limit Enable

**:LIMits:AF:DISTortion:UPPer:ENABle**
**:LIMits:AF:DISTortion:UPPer:ENABle?**

| | |
|---|---|
| **Description:** | Set command Enables/Disables Upper Limit for AF Distortion measurement. Query command returns parameter setting. |
| **Parameter:** | OFF | ON | 0 | 1 |
| **Default Value:** | OFF |
| **Set/Query Format:** | Boolean |
| **Example:** | :LIMits:AF:DISTortion:UPPer:ENABle ON |
| | Enables Upper Limit for AF Distortion measurement. |
| **Query Response:** | :LIMits:AF:DISTortion:UPPer:ENABle? |
| | 1 |

## 5.5.8      AF Distortion - Upper Limit Value

**:LIMits:AF:DISTortion:UPPer:VALue**
**:LIMits:AF:DISTortion:UPPer:VALue?**

| | |
|---:|:---|
| **Description:** | Set command defines the Upper Limit Value for AF Distortion measurement. |
| | Query command returns parameter setting. |
| **Range:** | 0.0 to 100.0% |
| **Units:** | % (percent) |
| **Default Value:** | 5.0% |
| **Set/Query Format:** | NRf \| NR2 |
| **Example:** | :LIMits:AF:DISTortion:UPPer:VALue 1 |
| | Sets Upper Limit Value for AF Distortion measurement to 1.0%. |
| **Query Response:** | :LIMits:AF:DISTortion:UPPer:VALue? |
| | 1.00 |

## 5.6    AF FREQUENCY MEASUREMENTS

### 5.6.1    AF Frequency - Averages

**:CONFigure:AF:ANALyzer:FREQuency:AVERage**
**:CONFigure:AF:ANALyzer:FREQuency:AVERage?**

|  |  |
|---|---|
| **Description:** | Set command defines the number of readings taken to calculate Average AF Frequency measurement. |
|  | Query command returns parameter setting. |
| **Range:** | 1 to 250 |
| **Default Value:** | 1 |
| **Set/Query Format:** | NR1 |
| **Example:** | :CONFigure:AF:ANALyzer:FREQuency:AVERage 75 |
|  | Sets number of readings taken to calculate Average AF Frequency measurement to 75. |
| **Query Response:** | :CONFigure:AF:ANALyzer:FREQuency:AVERage? |
|  | 75 |

### 5.6.2    AF Frequency - Average Measurement Reset

**:AF:ANALyzer:FREQuency:CLEAR:AVG**

|  |  |
|---|---|
| **Description:** | Command clears and resets Average AF Frequency measurement. |
| **Parameter/Query:** | none |

### 5.6.3    AF Frequency - Lower Limit Enable

**:LIMits:AF:FREQuency:LOWer:ENABle**
**:LIMits:AF:FREQuency:LOWer:ENABle?**

|  |  |
|---|---|
| **Description:** | Set command Enables/Disables Lower Limit for AF Frequency measurement. |
|  | Query command returns parameter setting. |
| **Parameter:** | OFF \| ON \| 0 \| 1 |
| **Set/Query Format:** | Boolean |
| **Default Value:** | OFF |
| **Example:** | :LIMits:AF:FREQuency:LOWer:ENABle ON |
|  | Enables Lower Limit for AF Frequency measurement. |
| **Query Response:** | :LIMits:AF:FREQuency:LOWer:ENABle? |
|  | 1 |

### 5.6.4 AF Frequency - Lower Limit Value

**:LIMits:AF:FREQuency:LOWer:VALue**
**:LIMits:AF:FREQuency:LOWer:VALue?**

| | |
|---|---|
| **Description:** | Set command defines the Lower Limit Value for AF Frequency measurement. Query command returns parameter setting. |
| **Range:** | 0.0 Hz to 20.0 kHz |
| **Units:** | Hz \| kHz |
| **Default Value:** | 0.0 kHz |
| **Set/Query Format:** | NRf \| NR2 |
| **Example:** | :LIMits:AF:FREQuency:LOWer:VALue 1Hz |
| | Sets Lower Limit Value for AF Frequency measurement to 1.0 Hz. |
| **Query Response:** | :LIMits:AF:FREQuency:LOWer:VALue? |
| | 1.0 |

### 5.6.5 AF Frequency - Measurement Query

**:FETCh:AF:ANALyzer:FREQuency?**

| | |
|---|---|
| **Description:** | Command returns AF Frequency measurement data. |
| **Query Data:** | <statusbyte>, <avgcount>, <avg(Hz)> |

| NOTE | Refer to Chapter 1 for UUT Measurement Meter Return Data. |
|---|---|

| | |
|---|---|
| **Query Response:** | :FETCh:AF:ANALyzer:FREQuency? |
| | 0,25,1000.0 |

| NOTE | Protocol must be set to Analog to return valid AF Frequency measurement data. |
|---|---|

### 5.6.6 AF Frequency - Peak Measurement Reset

**:AF:ANALyzer:FREQuency:CLEAR:PEAK**

| | |
|---|---|
| **Description:** | Command clears and resets Peak AF Frequency measurement. |
| **Parameter/Query:** | none |

### 5.6.7 AF Frequency - Upper Limit Enable

**:LIMits:AF:FREQuency:UPPer:ENABle**
**:LIMits:AF:FREQuency:UPPer:ENABle?**

| | |
|---|---|
| **Description:** | Set command Enables/Disables Upper Limit for AF Frequency measurement. Query command returns parameter setting. |
| **Parameter:** | OFF \| ON \| 0 \| 1 |
| **Set/Query Format:** | Boolean |
| **Default Value:** | OFF |
| **Example:** | :LIMits:AF:FREQuency:UPPer:ENABle ON |
| | Enables Upper Limit for AF Frequency measurement. |
| **Query Response:** | :LIMits:AF:FREQuency:UPPer:ENABle? |
| | 1 |

## 5.6.8 AF Frequency - Upper Limit Value

**:LIMits:AF:FREQuency:UPPer:VALue**
**:LIMits:AF:FREQuency:UPPer:VALue?**

|  |  |
|---|---|
| **Description:** | Set command defines the Upper Limit Value for AF Frequency measurement. |
|  | Query command returns parameter setting. |
| **Range:** | 0.0 Hz to 20.0 kHz |
| **Units:** | Hz \| kHz |
| **Default Value:** | 0.0 kHz |
| **Set/Query Format:** | NRf \| NR2 |
| **Example:** | :LIMits:AF:FREQuency:UPPer:VALue 2Hz |
|  | Sets Upper Limit Value for AF Frequency measurement to 2.0 Hz. |
| **Query Response:** | :LIMits:AF:FREQuency:UPPer:VALue? |
|  | 2.0 |

## 5.7    AF HUM & NOISE MEASUREMENTS

### 5.7.1    AF Hum & Noise - Averages

**:CONFigure:AF:ANALyzer:HN:AVERage**
**:CONFigure:AF:ANALyzer:HN:AVERage?**

|  |  |
|---|---|
| **Description:** | Set command defines the number of readings taken to calculate Average AF Hum & Noise measurement. |
| | Query command returns parameter setting. |
| **Range:** | 1 to 250 |
| **Default Value:** | 1 |
| **Set/Query Format:** | NR1 |
| **Example:** | :CONFigure:AF:ANALyzer:HN:AVERage 75 |
| | Sets number of readings being taken to calculate Average AF Hum & Noise measurement to 75. |
| **Query Response:** | :CONFigure:AF:ANALyzer:HN:AVERage? |
| | 75 |

> **NOTE**  AF Analyzer Noise measurement type must be defined as Signal to Noise Ratio (:AF:ANALyzer:NTYPe SN) and SNR measurement defined as Hum & Noise (:CONFigure:AF:ANALyzer:SNR:MODE 0) to obtain valid Hum & Noise measurement.

### 5.7.2    AF Hum & Noise - Average Measurement Reset

**:AF:ANALyzer:HN:CLEAR:AVG**

|  |  |
|---|---|
| **Description:** | Command clears and resets Average AF Hum & Noise measurement. |
| **Parameter/Query:** | none |

### 5.7.3    AF Hum & Noise - Lower Limit Enable

**:LIMits:AF:HN:LOWer:ENABle**
**:LIMits:AF:HN:LOWer:ENABle?**

|  |  |
|---|---|
| **Description:** | Set command Enables/Disables Lower Limit for AF Hum and Noise measurement. |
| | Query command returns parameter setting. |
| **Parameter:** | OFF \| ON \| 0 \| 1 |
| **Default Value:** | OFF |
| **Set/Query Format:** | Boolean |
| **Example:** | :LIMits:AF:HN:LOWer:ENABle ON |
| | Enables Lower Limit for Hum & Noise measurement. |
| **Query Response:** | :LIMits:AF:HN:LOWer:ENABle? |
| | 1 |

> **NOTE**  AF Analyzer Noise measurement type must be defined as Signal to Noise Ratio (:AF:ANALyzer:NTYPe SN) and SNR measurement defined as Hum & Noise (:CONFigure:AF:ANALyzer:SNR:MODE 0) to obtain valid Hum & Noise measurement.

### 5.7.4　　　　AF Hum & Noise - Lower Limit Value

**:LIMits:AF:HN:LOWer:VALue**
**:LIMits:AF:HN:LOWer:VALue?**

| | |
|---|---|
| **Description:** | Set command defines Lower Limit Value for AF Hum and Noise measurement. Query command returns parameter setting. |
| **Range:** | -100.0 to +100.0 dBr |
| **Units:** | dBr |
| **Default Value:** | 0.0 dBr |
| **Set/Query Format:** | NRf \| NR2 |
| **Example:** | :LIMits:AF:HN:LOWer:VALue -50dBr |
| | Sets Lower Limit Value for AF Hum & Noise measurement to -50.0 dBr. |
| **Query Response:** | :LIMits:AF:HN:LOWer:VALue? |
| | -50.00 |

| NOTE | AF Analyzer Noise measurement type must be defined as Signal to Noise Ratio (:AF:ANALyzer:NTYPe SN) and SNR measurement defined as Hum & Noise (:CONFigure:AF:ANALyzer:SNR:MODE 0) to obtain valid Hum & Noise measurement. |
|---|---|

### 5.7.5　　　　AF Hum & Noise - Measurement Query

**:FETCh:AF:ANALyzer:HN?**

| | |
|---|---|
| **Description:** | Command returns AF Hum and Noise measurement data. |
| **Query Data:** | \<statusbyte\>,\<failbyte\>,\<avgcount\>,\<avg(dB)\>,\<wc(dB)\> |

| NOTE | Refer to Chapter 1 for UUT Measurement Meter Return Data. |
|---|---|

| | |
|---|---|
| **Query Response:** | :FETCh:AF:ANALyzer:HN? |
| | 0,0,10,-8.43,-8.43 |

| NOTE | AF Analyzer Noise measurement type must be defined as Signal to Noise Ratio (:AF:ANALyzer:NTYPe SN) and SNR measurement defined as Hum & Noise (:CONFigure:AF:ANALyzer:SNR:MODE 0) to obtain valid Hum & Noise measurement. |
|---|---|

### 5.7.6　　　　AF Hum & Noise - Peak Measurement Reset

**:AF:ANALyzer:HN:CLEAR:PEAK**

| | |
|---|---|
| **Description:** | Command clears and resets Peak AF Hum & Noise measurement. |
| **Parameter/Query:** | none |

### 5.7.7　　　　AF Hum & Noise - Reference Lock

**:CONFigure:AF:ANALyzer:HN:REFerence**

| | |
|---|---|
| **Description:** | Command locks AF Hum and Noise reference to current meter reading. |
| **Parameter/Query:** | none |

| NOTE | SNR measurement must be defined as Hum & Noise to obtain valid Hum & Noise measurement (:CONFigure:AF:ANALyzer:SNR:MODE HN). |
|---|---|

### 5.7.8 AF Hum & Noise - Reference Value

**:CONFigure:AF:ANALyzer:HN:REFerence:VALue**
**:CONFigure:AF:ANALyzer:HN:REFerence:VALue?**

| | |
|---|---|
| **Description:** | Set command defines the reference value for AF Hum and Noise measurement. |
| | Query command returns parameter setting. |
| **Range:** | -100.0 to +100.0 dB |
| **Units:** | dB |
| **Default Value:** | 12.0 dB |
| **Set/Query Format:** | NRf \| NR2 |
| **Example:** | :CONFigure:AF:ANALyzer:HN:REFerence:VALue 1dB |
| | Sets Hum & Noise Reference value to 1.0 dB. |
| **Query Response:** | :CONFigure:AF:ANALyzer:HN:REFerence:VALue? |
| | 1.00 |

| NOTE | Query command returns HN Reference Value using :CONFigure:AF:ANALyzer:HN:REFerence command. |
|---|---|

AF Analyzer Noise measurement type must be defined as Signal to Noise Ratio (:AF:ANALyzer:NTYPe SN) and SNR measurement defined as Hum & Noise (:CONFigure:AF:ANALyzer:SNR:MODE 0) to obtain valid Hum & Noise measurement.

### 5.7.9 AF Hum & Noise - Upper Limit Enable

**:LIMits:AF:HN:UPPer:ENABle**
**:LIMits:AF:HN:UPPer:ENABle?**

| | |
|---|---|
| **Description:** | Set command Enables/Disables Upper Limit for AF Hum and Noise measurement. |
| | Query command returns parameter setting. |
| **Parameter:** | OFF \| ON \| 0 \| 1 |
| **Default Value:** | OFF |
| **Set/Query Format:** | Boolean |
| **Example:** | :LIMits:AF:HN:UPPer:ENABle ON |
| | Enables Upper Limit for Hum & Noise measurement. |
| **Query Response:** | :LIMits:AF:HN:UPPer:ENABle?. |
| | 1 |

| NOTE | AF Analyzer Noise measurement type must be defined as Signal to Noise Ratio (:AF:ANALyzer:NTYPe SN) and SNR measurement defined as Hum & Noise (:CONFigure:AF:ANALyzer:SNR:MODE 0) to obtain valid Hum & Noise measurement. |
|---|---|

## 5.7.10 AF Hum & Noise - Upper Limit Value

**:LIMits:AF:HN:UPPer:VALue**
**:LIMits:AF:HN:UPPer:VALue?**

| | |
|---:|:---|
| **Description:** | Set command defines the Upper Limit Value for AF Hum and Noise measurement. |
| | Query command returns parameter setting. |
| **Range:** | -100.0 to +100.0 dBr |
| **Units:** | dBr |
| **Default Value:** | 10.0 dBr |
| **Set/Query Format:** | NRf \| NR2 |
| **Example:** | :LIMits:AF:HN:UPPer:VALue 25dBr |
| | Sets Lower Limit Value for AF Hum & Noise measurement to 25.0 dBr. |
| **Query Response:** | :LIMits:AF:HN:UPPer:VALue? |
| | 25 |

| | |
|---|---|
| NOTE | AF Analyzer Noise measurement type must be defined as Signal to Noise Ratio (:AF:ANALyzer:NTYPe SN) and SNR measurement defined as Hum & Noise (:CONFigure:AF:ANALyzer:SNR:MODE 0) to obtain valid Hum & Noise measurement. |

## 5.8          AF LEVEL MEASUREMENTS

### 5.8.1          AF Level - Averages

**:CONFigure:AF:ANALyzer:LEVel:AVERage**
**:CONFigure:AF:ANALyzer:LEVel:AVERage?**

| | |
|---|---|
| **Description:** | Set command defines the number of readings taken to calculate Average AF Level measurement. |
| | Query command returns parameter setting. |
| **Range:** | 1 to 250 |
| **Set/Query Format:** | NR1 |
| **Default Value:** | 1 |
| **Example:** | :CONFigure:AF:ANALyzer:LEVel:AVERage 75 |
| | Sets number of readings being taken to calculate Average AF Level measurement to 75. |
| **Query Response:** | :CONFigure:AF:ANALyzer:LEVel:AVERage? |
| | 75 |

### 5.8.2          AF Level - Average Measurement Reset

**:AF:ANALyzer:LEVel:CLEAR:AVG**

| | |
|---|---|
| **Description:** | Command clears and resets Average AF Level measurement. |
| **Parameter/Query:** | none |

### 5.8.3          AF Level - Lower Limit Enable

**:LIMits:AF:LEVel:LOWer:ENABle**
**:LIMits:AF:LEVel:LOWer:ENABle?**

| | |
|---|---|
| **Description:** | Set command Enables/Disables Lower Limit for AF Level measurement. |
| | Query command returns parameter setting. |
| **Parameter:** | OFF \| ON \| 0 \| 1 |
| **Set/Query Format:** | Boolean |
| **Default Value:** | OFF |
| **Example:** | :LIMits:AF:LEVel:LOWer:ENABle ON |
| | Enables Lower Limit for AF Level measurement. |
| **Query Response:** | :LIMits:AF:LEVel:LOWer:ENABle? |
| | 1 |

## 5.8.4        AF Level - Lower Limit Value

**:LIMits:AF:LEVel:LOWer:VALue**
**:LIMits:AF:LEVel:LOWer:VALue?**

|  |  |
|---|---|
| **Description:** | Set command defines the Lower Limit Value for AF Level measurement. |
|  | Query command returns parameter setting. |
| **Range:** | 1.0 mV to 30.0 V |
| **Units:** | mV \| V \| dBV \| dBr \| dBm |
| **Default Value:** | 1.0 mV |
| **Set/Query Format:** | NRf <units>\| NR1 <units> |
| **Example:** | :LIMits:AF:LEVel:LOWer:VALue 2V |
|  | Sets Lower Limit Value for AF Level measurement to 2 Volts. |
| **Query Response:** | :LIMits:AF:LEVel:LOWer:VALue? mV |
|  | 2000.0 |

| NOTE | If units is not defined in Set or Query command, value defaults to units specified for AF Level measurements. |
|---|---|
|  | dBV is not valid when Audio Balanced (BAL) is selected as the Audio Input Source. |

## 5.8.5        AF Level - Measurement Query

**:FETCh:AF:ANALyzer:LEVel?**

|  |  |
|---|---|
| **Description:** | Command return the AF Level measurement data. |
| **Query Data:** | <statusbyte>,<failbyte>,<avgcount>,<avg> |

| NOTE | Refer to Chapter 1 for UUT Measurement Meter Return Data. |
|---|---|

|  |  |
|---|---|
| **Units:** | V (Unbalanced) |
|  | dBm (Balanced) |
| **Query Response:** | :FETCh:AF:ANALyzer:LEVel? |
|  | 0,0,1,3.11 |

| NOTE | Protocol must be set to Analog to return valid measurement data. |
|---|---|

## 5.8.6        AF Level - Peak Measurement Reset

**:AF:ANALyzer:LEVel:CLEAR:PEAK**

|  |  |
|---|---|
| **Description:** | Command clears and resets Peak AF Level measurement. |
| **Parameter/Query:** | none |

### 5.8.7 AF Level - Units

**:CONFigure:AF:ANALyzer:LEVel:UNIts**
**:CONFigure:AF:ANALyzer:LEVel:UNIts?**

| | |
|---|---|
| **Description:** | Set command defines the unit of measure for AF Level measurement. |
| | Query command returns parameter setting. |
| **Parameter:** | V \| dBV \| dBm \| dBr |
| **Default Value:** | dBm |
| **Set/Query Format:** | CPD \| CRD |
| **Example:** | :CONFigure:AF:ANALyzer:LEVel:UNIts dBr |
| | Displays AF Level measurement in dBr. |
| **Query Response:** | :CONFigure:AF:ANALyzer:LEVel:UNIts? |
| | DBR |

### 5.8.8 AF Level - Upper Limit Enable

**:LIMits:AF:LEVel:UPPer:ENABle**
**:LIMits:AF:LEVel:UPPer:ENABle?**

| | |
|---|---|
| **Description:** | Set command Enables/Disables Upper Limit for AF Level measurement. |
| | Query command returns parameter setting. |
| **Parameter:** | OFF \| ON \| 0 \| 1 |
| **Set/Query Format:** | Boolean |
| **Default Value:** | OFF |
| **Example:** | :LIMits:AF:LEVel:UPPer:ENABle ON |
| | Enables Upper Limit for AF Level measurement. |
| **Query Response:** | :LIMits:AF:LEVel:UPPer:ENABle? |
| | 1 |

### 5.8.9 AF Level - Upper Limit Value

**:LIMits:AF:LEVel:UPPer:VALue**
**:LIMits:AF:LEVel:UPPer:VALue?**

| | |
|---|---|
| **Description:** | Set command define the Upper Limit Value for AF Level measurement. |
| | Query command returns parameter setting. |
| **Range:** | 1.0 mV to 30.0 V |
| **Units:** | mV \| V \| dBV \| dBr \| dBm |
| **Default Value:** | 10.0 V |
| **Set/Query Format:** | NRf <units>\| NR1 <units> |
| **Example:** | :LIMits:AF:LEVel:UPPer:VALue 5V |
| | Sets Upper Limit Value for AF Level measurement to 5 Volts |
| **Query Response:** | :LIMits:AF:LEVel:UPPer:VALue? mV |
| | 5000.0 |

> **NOTE** If units is not defined in Set or Query command, value defaults to units specified for AF Level measurements.
>
> dBV is not valid when Audio Balanced (BAL) is selected as the Audio Input Source.

## 5.9 AF SINAD MEASUREMENTS

### 5.9.1 AF Sinad - Averages

**:CONFigure:AF:ANALyzer:SINad:AVERage**
**:CONFigure:AF:ANALyzer:SINad:AVERage?**

| | |
|---|---|
| **Description:** | Set command defines the number of readings taken to calculate Average AF Sinad measurement. |
| | Query command returns parameter setting. |
| **Range:** | 1 to 250 |
| **Default Value:** | 1 |
| **Set/Query Format:** | NR1 |
| **Example:** | :CONFigure:AF:ANALyzer:SINad:AVERage 25 |
| | Sets number of readings taken to calculate Average AF Sinad measurement to 75. |
| **Query Response:** | :CONFigure:AF:ANALyzer:SINad:AVERage? |
| | 75 |

### 5.9.2 AF Sinad - Average Measurement Reset

**:AF:ANALyzer:SINad:CLEAR:AVG**

| | |
|---|---|
| **Description:** | Command clears and resets Average AF Sinad measurement. |
| **Parameter/Query:** | none |

### 5.9.3 AF Sinad - Lower Limit Enable

**:LIMits:AF:SINad:LOWer:ENABle**
**:LIMits:AF:SINad:LOWer:ENABle?**

| | |
|---|---|
| **Description:** | Set command Enables/Disables Lower Limit for AF Sinad measurement. |
| | Query command returns parameter setting. |
| **Parameter:** | OFF \| ON \| 0 \| 1 |
| **Default Value:** | OFF |
| **Set/Query Format:** | Boolean |
| **Example:** | :LIMits:AF:SINad:LOWer:ENABle ON |
| | Enables Lower Limit for AF Sinad measurement. |
| **Query Response:** | :LIMits:AF:SINad:LOWer:ENABle? |
| | 1 |

### 5.9.4        AF Sinad - Lower Limit Value

**:LIMits:AF:SINad:LOWer:VALue**
**:LIMits:AF:SINad:LOWer:VALue?**

| | |
|---|---|
| **Description:** | Set command defines the Lower Limit Value for AF Sinad measurement. Query command returns parameter setting. |
| **Range:** | 0.0 to 100.0 dB |
| **Units:** | dB |
| **Default Value:** | 0.0 dB |
| **Set/Query Format:** | NRf \| NR1 |
| **Example:** | :LIMits:AF:SINad:LOWer:VALue 50dB |
| | Sets Lower Limit Value for AF Sinad measurement to 50 dB. |
| **Query Response:** | :LIMits:AF:SINad:LOWer:VALue? |
| | 50 |

### 5.9.5        AF Sinad - Measurement Query

**:FETCh:AF:ANALyzer:SINad?**

| | |
|---|---|
| **Description:** | Command returns Sinad measurement data. |
| **Query Data:** | <statusbyte>,<failbyte>,<avgcount>,<avg(dB)>,<wc(dB)> |

> **NOTE** Refer to Chapter 1 for UUT Measurement Meter Return Data.

| | |
|---|---|
| **Query Response:** | :FETCh:AF:ANALyzer:SINad? |
| | 0,0,25,0.01,0.03 |

> **NOTE** Protocol must be set to Analog to return valid AF Sinad measurement data.

### 5.9.6        AF Sinad - Peak Measurement Reset

**:AF:ANALyzer:SINad:CLEAR:PEAK**

| | |
|---|---|
| **Description:** | Command clears and resets Peak AF Sinad measurement. |
| **Parameter/Query:** | none |

### 5.9.7        AF Sinad - Upper Limit Enable

**:LIMits:AF:SINad:UPPer:ENABle**
**:LIMits:AF:SINad:UPPer:ENABle?**

| | |
|---|---|
| **Description:** | Set command Enables/Disables Upper Limit for AF Sinad measurement. Query command returns parameter setting. |
| **Parameter:** | OFF \| ON \| 0 \| 1 |
| **Default Value:** | OFF |
| **Set/Query Format:** | Boolean |
| **Example:** | :LIMits:AF:SINad:UPPer:ENABle ON |
| | Enables Upper Limit for AF Sinad measurement. |
| **Query Response:** | :LIMits:AF:SINad:UPPer:ENABle? |
| | 1 |

## 5.9.8 AF Sinad - Upper Limit Value

**:LIMits:AF:SINad:UPPer:VALue**
**:LIMits:AF:SINad:UPPer:VALue?**

| | |
|---:|:---|
| **Description:** | Set command defines the Upper Limit Value for AF Sinad measurement. |
| | Query command returns parameter setting. |
| **Range:** | 0.0 to 100.0 dB |
| **Units:** | dB |
| **Default Value:** | 0.0 dB |
| **Set/Query Format:** | NRf \| NR1 |
| **Example:** | :LIMits:AF:SINad:UPPer:VALue 50dB |
| | Set Upper Limit Value for AF Sinad measurement to 50 dB. |
| **Query Response:** | :LIMits:AF:SINad:UPPer:VALue? |
| | 50 |

## 5.10     AF SNR MEASUREMENTS

### 5.10.1     AF SNR - Averages

**:CONFigure:AF:ANALyzer:SNR:AVERage**
**:CONFigure:AF:ANALyzer:SNR:AVERage?**

| | |
|---|---|
| **Description:** | Set command defines the number of readings taken to calculate Average AF SNR measurement. |
| | Query command returns parameter setting. |
| **Range:** | 1 to 250 |
| **Default Value:** | 1 |
| **Set/Query Format:** | NR1 |
| **Example:** | :CONFigure:AF:ANALyzer:SNR:AVERage 75 |
| | Sets number of readings taken to calculate Average AF SNR measurement to 75. |
| **Query Response:** | :CONFigure:AF:ANALyzer:SNR:AVERage? |
| | 75 |

> **NOTE** AF Analyzer Noise measurement type must be defined as Signal to Noise Ratio (:AF:ANALyzer:NTYPe SN) and SNR measurement defined as Normal (:CONFigure:AF:ANALyzer:SNR:MODE 1) to obtain valid SNR measurement.

### 5.10.2     AF SNR - Average Measurement Reset

**:AF:ANALyzer:SNR:CLEAR:AVG**

| | |
|---|---|
| **Description:** | Command clears and resets Average AF Signal to Noise Ratio measurement. |
| **Parameter/Query:** | none |

### 5.10.3     AF SNR - Lower Limit Enable

**:LIMits:AF:SNR:LOWer:ENABle**
**:LIMits:AF:SNR:LOWer:ENABle?**

| | |
|---|---|
| **Description:** | Set command Enables/Disables Lower Limit for AF Signal to Noise Ratio measurement. |
| | Query command returns parameter setting. |
| **Parameter:** | OFF \| ON \| 0 \| 1 |
| **Default Value:** | OFF |
| **Set/Query Format:** | Boolean |
| **Example:** | :LIMits:AF:SNR:LOWer:ENABle ON |
| | Enables Lower Limit for AF SNR measurement. |
| **Query Response:** | :LIMits:AF:SNR:LOWer:ENABle? |
| | 1 |

> **NOTE** AF Analyzer Noise measurement type must be defined as Signal to Noise Ratio (:AF:ANALyzer:NTYPe SN) and SNR measurement defined as Normal (:CONFigure:AF:ANALyzer:SNR:MODE 1) to obtain valid SNR measurement.

### 5.10.4     AF SNR - Lower Limit Value

**:LIMits:AF:SNR:LOWer:VALue**
**:LIMits:AF:SNR:LOWer:VALue?**

| | |
|---|---|
| **Description:** | Set command defines the Lower Limit Value for AF Signal to Noise Ratio measurement. |
| | Query command returns parameter setting. |
| **Range:** | -100.0 to +100.0 dBr |
| **Units:** | dBr |
| **Default Value:** | 0.0 dBr |
| **Set/Query Format:** | NRf \| NR1 |
| **Example:** | :LIMits:AF:SNR:LOWer:VALue 50dBr |
| | Sets Lower Limit Value for AF SNR measurement to 50.0 dBr. |
| **Query Response:** | :LIMits:AF:SNR:LOWer:VALue? |
| | 50 |

| NOTE | AF Analyzer Noise measurement type must be defined as Signal to Noise Ratio (:AF:ANALyzer:NTYPe SN) and SNR measurement defined as Normal (:CONFigure:AF:ANALyzer:SNR:MODE 1) to obtain valid SNR measurement. |
|---|---|

### 5.10.5     AF SNR - Mode

**:CONFigure:AF:ANALyzer:SNR:MODE**
**:CONFigure:AF:ANALyzer:SNR:MODE?**

| | |
|---|---|
| **Description:** | Set command defines the SNR Meter Mode (Normal or Hum and Noise) when performing Signal to Noise Ratio measurement. |
| | Query command returns parameter setting. |
| **Parameter:** | 0 = Hum & Noise |
| | 1 = Normal |
| **Default Value:** | 0 |
| **Set/Query Format:** | NR1 |
| **Example:** | :CONFigure:AF:ANALyzer:SNR:MODE 0 |
| | Sets AF Signal to Noise measurement to Hum & Noise measurement. |
| **Query Response:** | :CONFigure:AF:ANALyzer:SNR:MODE? |
| | 0 |

| NOTE | AF Analyzers Noise measurement type must be defined as SN for command to be valid (:AF:ANALyzer:NTYPe SN). |
|---|---|

### 5.10.6     AF SNR - Measurement Query

**:FETCh:AF:ANALyzer:SNR?**

| | |
|---|---|
| **Description:** | Command returns AF Signal to Noise Ratio measurement data. |
| **Query Data:** | <statusbyte>,<failbyte>,<avg(dB)>,<wc(dB)> |

| NOTE | Refer to Chapter 1 for UUT Measurement Meter Return Data. |
|---|---|

| | |
|---|---|
| **Query Response:** | :FETCh:AF:ANALyzer:SNR? |
| | 0,0,25,-1.99 |

| NOTE | AF Analyzer Noise measurement type must be defined as Signal to Noise Ratio (:AF:ANALyzer:NTYPe SN) and SNR measurement defined as Normal (:CONFigure:AF:ANALyzer:SNR:MODE 1) to obtain valid SNR measurement. |
|---|---|

(*rci meter mode compatible: see :SYSTem:RCI :METER:MODE)

### 5.10.7 AF SNR - Peak Measurement Reset

**:AF:ANALyzer:SNR:CLEAR:PEAK**

| | |
|---|---|
| **Description:** | Command clears and resets Peak AF Signal to Noise Ratio measurement. |
| **Parameter/Query:** | none |

### 5.10.8 AF SNR - Upper Limit Enable

**:LIMits:AF:SNR:UPPer:ENABle**
**:LIMits:AF:SNR:UPPer:ENABle?**

| | |
|---|---|
| **Description:** | Set command Enables/Disables Upper Limit for AF Signal to Noise Ratio measurement. |
| | Query command returns parameter setting. |
| **Parameter:** | OFF \| ON \| 0 \| 1 |
| **Default Value:** | OFF |
| **Set/Query Format:** | Boolean |
| **Example:** | :LIMits:AF:SNR:UPPer:ENABle ON |
| | Enables Upper Limit for AF SNR measurement. |
| **Query Response:** | :LIMits:AF:SNR:UPPer:ENABle? |
| | 1 |

| NOTE | AF Analyzer Noise measurement type must be defined as Signal to Noise Ratio (:AF:ANALyzer:NTYPe SN) and SNR measurement defined as Normal (:CONFigure:AF:ANALyzer:SNR:MODE 1) to obtain valid SNR measurement. |
|---|---|

### 5.10.9 AF SNR - Upper Limit Value

**:LIMits:AF:SNR:UPPer:VALue**
**:LIMits:AF:SNR:UPPer:VALue?**

| | |
|---|---|
| **Description:** | Set command defines the Upper Limit Value for AF Signal to Noise Ratio measurement. |
| | Query command returns parameter setting. |
| **Range:** | -100.0 to +100.0 dBr |
| **Units:** | dBr |
| **Default Value:** | 10.0 dBr |
| **Set/Query Format:** | NRf \| NR2 |
| **Example:** | :LIMits:AF:SNR:UPPer:VALue 50dBr |
| | Sets Upper Limit Value for AF SNR measurement to 50.0 dBr. |
| **Query Response:** | :LIMits:AF:SNR:UPPer:VALue? |
| | 50 |

| NOTE | AF Analyzer Noise measurement type must be defined as Signal to Noise Ratio (:AF:ANALyzer:NTYPe SN) and SNR measurement defined as Normal (:CONFigure:AF:ANALyzer:SNR:MODE 1) to obtain valid SNR measurement. |
|---|---|

## 5.11 BROADBAND POWER

### 5.11.1 Broadband Power - Averages

**:CONFigure:RF:ANALyzer:TRBPower:AVERage**
**:CONFigure:RF:ANALyzer:TRBPower:AVERage?**

|                      |                                                                                                       |
|----------------------|-------------------------------------------------------------------------------------------------------|
| **Description:**     | Set command defines number of readings taken to calculate Average Broadband Power measurement.        |
|                      | Query command returns parameter setting.                                                              |
| **Range:**           | 1 to 250                                                                                              |
| **Default Value:**   | 1                                                                                                     |
| **Set/Query Format:**| NR1                                                                                                   |
| **Example:**         | :CONFigure:RF:ANALyzer:TRBPower:AVERage 25                                                            |
|                      | Sets number of readings taken to calculate Average Broadband Power measurement to 25.                 |
| **Query Response:**  | :CONFigure:RF:ANALyzer:TRBPower:AVERage?                                                              |
|                      | 25                                                                                                    |

### 5.11.2 Broadband Power - Lower Limit Enable

**:LIMits:RF:TRBPower:LOWer:ENABle**
**:LIMits:RF:TRBPower:LOWer:ENABle?**

|                      |                                                                                                       |
|----------------------|-------------------------------------------------------------------------------------------------------|
| **Description:**     | Set command Enables/Disables Lower Limit for Broadband Power measurement.                             |
|                      | Query command returns parameter setting.                                                              |
| **Parameter:**       | OFF \| ON \| 0 \| 1                                                                                   |
| **Default Value:**   | OFF                                                                                                   |
| **Set/Query Format:**| Boolean                                                                                               |
| **Example:**         | :LIMits:RF:TRBPower:LOWer:ENABle ON                                                                   |
|                      | Enables Lower Limit for Broadband Power measurement.                                                  |
| **Query Response:**  | :LIMits:RF:TRBPower:LOWer:ENABle?                                                                     |
|                      | 1                                                                                                     |

### 5.11.3 Broadband Power - Lower Limit Value

**:LIMits:RF:TRBPower:LOWer:VALue**
**:LIMits:RF:TRBPower:LOWer:VALue?**

|                      |                                                                                                       |
|----------------------|-------------------------------------------------------------------------------------------------------|
| **Description:**     | Set command defines Lower Limit Value for Broadband Power measurement.                                |
|                      | Query command returns parameter setting.                                                              |
| **Range:**           | -140.0 to +70.0 dBm                                                                                   |
| **Units:**           | mW \| W \| dBW \| dBm                                                                                 |
| **Default Value:**   | 100.0 µW                                                                                              |
| **Set/Query Format:**| NRf \| NR2 (W)                                                                                        |
| **Example:**         | :LIMits:RF:TRBPower:LOWer:VALue -45dBm                                                                |
|                      | Sets Lower Limit Value for Broadband measurement to -45.0 dBm.                                        |
| **Query Response:**  | :LIMits:RF:TRBPower:LOWer:VALue?                                                                      |
|                      | 0.0                                                                                                   |

### 5.11.4 Broadband Power - Measurement Query

**:FETCh:RF:ANALyzer:TRBPower? <units>**

| | |
|---|---|
| **Description:** | Command returns Broadband Power measurement data. |
| **Query Data:** | <statusbyte>,<failbyte>,<avgcount>,<avg> |

> **NOTE** Refer to Chapter 1 for UUT Measurement Meter Return Data.

| | |
|---|---|
| **Units:** | W \| dBW \| dBM |
| **Query Response:** | :FETCh:RF:ANALyzer:TRBPower? DBW |
| | 1,5,1,0.0013 |

> **NOTE** RF Input must be set to TR to return valid data.

### 5.11.5 Broadband Power - Peak Measurement Query

**:FETCh:RF:ANALyzer:TRBPower:HOLD?**

| | |
|---|---|
| **Description:** | Command returns Peak Broadband Power measurement data. |
| **Query Data:** | <statusbyte>,<failbyte>,<avgcount>,<avg> |

> **NOTE** Refer to Chapter 1 for UUT Measurement Meter Return Data.

| | |
|---|---|
| **Units:** | W \| dBW \| dBM |
| **Query Response:** | :FETCh:RF:ANALyzer:TRBPower:HOLD? |
| | 1,5,0.0091 |

> **NOTE** RF Input must be set to TR to return valid data.

### 5.11.6 Broadband Power - Units

**:CONFigure:RF:ANALyzer:TRBPower:UNIts**
**:CONFigure:RF:ANALyzer:TRBPower:UNIts?**

| | |
|---|---|
| **Description:** | Set command defines the unit of measurement for Broadband Power measurement. |
| | Query command returns parameter setting. |
| **Parameter:** | W \| dBW \| dBm |
| **Default Value:** | W |
| **Set/Query Format:** | CPD \| CRD |
| **Example:** | :CONFigure:RF:ANALyzer:TRBPower:UNIts DBW |
| | Displays Broadband Power measurement in dBW. |
| **Query Response:** | :CONFigure:RF:ANALyzer:TRBPower:UNIts? |
| | DBW |

### 5.11.7 Broadband Power - Upper Limit Enable

**:LIMits:RF:TRBPower:UPPer:ENABle**
**:LIMits:RF:TRBPower:UPPer:ENABle?**

|  |  |
|---|---|
| **Description:** | Set command Enables/Disables Upper Limit for Broadband Power measurement. |
|  | Query command returns parameter setting. |
| **Parameter:** | OFF \| ON \| 0 \| 1 |
| **Default Value:** | OFF |
| **Set/Query Format:** | Boolean |
| **Example:** | :LIMits:RF:TRBPower:UPPer:ENABle ON |
|  | Enables Upper Limit for Broadband Power measurement. |
| **Query Response:** | :LIMits:RF:TRBPower:UPPer:ENABle? |
|  | 1 |

### 5.11.8 Broadband Power - Upper Limit Value

**:LIMits:RF:TRBPower:UPPer:VALue**
**:LIMits:RF:TRBPower:UPPer:VALue?**

|  |  |
|---|---|
| **Description:** | Set command defines Upper Limit Value for Broadband Power measurement. |
|  | Query command returns parameter setting. |
| **Range:** | -140.0 to +70.0 dBm |
| **Units:** | mW \| W \| dBW \| dBm |
| **Default Value:** | 100.0 µW |
| **Set/Query Format:** | NRf \| NR2 (W) |
| **Example:** | :LIMits:RF:TRBPower:UPPer:VALue -25dBm |
|  | Sets Upper Limit Value for Broadband Power measurement to -25.0 dBm. |
| **Query Response:** | :LIMits:RF:TRBPower:UPPer:VALue? |
|  | 0.0 |

## 5.12    FM DEVIATION MEASUREMENTS

### 5.12.1    FM Deviation - Averages

**:CONFigure:MOD:ANALyzer:FM:AVERage**
**:CONFigure:MOD:ANALyzer:FM:AVERage?**

| | |
|---|---|
| **Description:** | Set command defines number of readings taken to calculate Average FM Deviation measurement. |
| | Query command returns parameter setting. |
| **Range:** | 1 to 250 |
| **Default Value:** | 1 |
| **Set/Query Format:** | NR1 |
| **Example:** | :CONFigure:MOD:ANALyzer:FM:AVERage 75 |
| | Sets number of readings taken to calculate Average FM Deviation measurement to 75. |
| **Query Response:** | :CONFigure:MOD:ANALyzer:FM:AVERage? |
| | 75 |

### 5.12.2    FM Deviation - Average Measurement Reset

**:MOD:ANALyzer:FM:CLEAR:AVG**

| | |
|---|---|
| **Description:** | Command clears and resets Average FM Deviation measurement. |
| **Parameter/Query:** | none |

### 5.12.3    FM Deviation - Lower Limit Enable

**:LIMits:MOD:FM:LOWer:ENABle**
**:LIMits:MOD:FM:LOWer:ENABle?**

| | |
|---|---|
| **Description:** | Set command Enables/Disables Lower Limit for FM Deviation measurement. |
| | Query command returns parameter setting. |
| **Parameter:** | OFF \| ON \| 0 \| 1 |
| **Default Value:** | OFF |
| **Set/Query Format:** | Boolean |
| **Example:** | :LIMits:MOD:FM:LOWer:ENABle ON |
| | Enables Lower Limit for FM Deviation measurement. |
| **Query Response:** | :LIMits:MOD:FM:LOWer:ENABle? |
| | 1 |

### 5.12.4 FM Deviation - Lower Limit Value

**:LIMits:MOD:FM:LOWer:VALue**
**:LIMits:MOD:FM:LOWer:VALue?**

| | |
|---|---|
| **Description:** | Set command defines Lower Limit Value for FM Deviation measurement. |
| | Query command returns parameter setting. |
| **Range:** | 0.0 Hz to 150.0 kHz |
| **Default Value:** | 0.0 Hz |
| **Set/Query Format:** | NRf \| NR2 |
| **Example:** | :LIMits:MOD:FM:LOWer:VALue 1.0Hz |
| | Sets Lower Limit Value for FM Deviation measurement to 1.0 Hz. |
| **Query Response:** | :LIMits:MOD:FM:LOWer:VALue? |
| | 1.0 |

| NOTE | Units defined by :CONFigure:MOD:ANALyzer:FM:UNIts command. |
|---|---|

### 5.12.5 FM Deviation - Measurement Query

**:FETCh:MOD:ANALyzer:FM?**

| | |
|---|---|
| **Description:** | Command returns FM Deviation measurement data. |
| **Query Data:** | \<statusbyte>, \<failbyte>, \<avgcount>, \<avg(Hz)>, \<max(Hz)>, \<min(Hz)> |

| NOTE | Refer to Chapter 1 for UUT Measurement Meter Return Data. |
|---|---|

| | |
|---|---|
| **Query Response:** | :FETCh:MOD:ANALyzer:FM? |
| | 0, 0, 1, 30.12, 43.47, 30.12 |

| NOTE | Protocol must be set to Analog to return valid measurement data. |
|---|---|

### 5.12.6 FM Deviation - Peak Measurement Reset

**:MOD:ANALyzer:FM:CLEAR:PEAK**

| | |
|---|---|
| **Description:** | Command clears and resets Peak FM Deviation measurement. |
| **Parameter/Query:** | none |

### 5.12.7 FM Deviation - Measurement Type

**:CONFigure:MOD:ANALyzer:FM:MTYPe**
**:CONFigure:MOD:ANALyzer:FM:MTYPe?**

| | |
|---|---|
| **Description:** | Set command defines measurement type for FM Deviation measurement. |
| | Query command returns parameter setting. |
| **Parameter:** | PEAK \| RMS |
| **Default Value:** | PEAK |
| **Set/Query Format:** | CPD \| CRD |
| **Example:** | :CONFigure:MOD:ANALyzer:FM:MTYPe RMS |
| | Sets Mod Analyzer Distortion measurement to RMS. |
| **Query Response:** | :CONFigure:MOD:ANALyzer:FM:MTYPe? |
| | RMS |

### 5.12.8    FM Deviation - Offset Enable

**:CONFigure:MOD:ANALyzer:FM:OFFSet:ENABle**
**:CONFigure:MOD:ANALyzer:FM:OFFSet:ENABle?**

| | |
|---|---|
| **Description:** | Set command defines the FM Deviation Offset mode of operation. |
| | Query command returns parameter setting. |
| **Parameter:** | OFF \| ON \| 0 \| 1 |
| **Default Value:** | ON |
| **Set/Query Format:** | Boolean |
| **Example:** | :CONFigure:MOD:ANALyzer:FM:OFFSet:ENABle ON |
| | Locks FM Deviation Frequency Offset to RF Analyzer Frequency. |
| **Query Response:** | :CONFigure:MOD:ANALyzer:FM:OFFSet:ENABle? |
| | 1 |

### 5.12.9    FM Deviation - Units

**:CONFigure:MOD:ANALyzer:FM:UNIts**
**:CONFigure:MOD:ANALyzer:FM:UNIts?**

| | |
|---|---|
| **Description:** | Set command defines the unit of measurement for FM Deviation measurement. |
| | Query command returns parameter setting. |
| **Parameter:** | dBr \| Hz |
| **Default Value:** | Hz |
| **Set/Query Format:** | CPD \| CRD |
| **Example:** | :CONFigure:MOD:ANALyzer:FM:UNIts dBr |
| | Displays FM Deviation measurements in dBr. |
| **Query Response:** | :CONFigure:MOD:ANALyzer:FM:UNIts? |
| | dBr |

| NOTE | Command defines unit of measurement for Upper and Lower Limit commands. |
|---|---|

### 5.12.10    FM Deviation - Upper Limit Enable

**:LIMits:MOD:FM:UPPer:ENABle**
**:LIMits:MOD:FM:UPPer:ENABle?**

| | |
|---|---|
| **Description:** | Set command Enables/Disables Upper Limit for FM Deviation measurement. |
| | Query command returns parameter setting. |
| **Parameter:** | OFF \| ON \| 0 \| 1 |
| **Default Value:** | OFF |
| **Set/Query Format:** | Boolean |
| **Example:** | :LIMits:MOD:FM:UPPer:ENABle ON |
| | Enables Upper Limit for FM Deviation measurement. |
| **Query Response:** | :LIMits:MOD:FM:UPPer:ENABle? |
| | 1 |

## 5.12.11 FM Deviation - Upper Limit Value

**:LIMits:MOD:FM:UPPer:VALue**
**:LIMits:MOD:FM:UPPer:VALue?**

| | |
|---|---|
| **Description:** | Set command defines Upper Limit Value for FM Deviation measurement. |
| | Query command returns parameter setting. |
| **Range:** | 0.0 Hz to 150.0 kHz |
| **Default Value:** | 0.0 Hz |
| **Set/Query Format:** | NRf \| NR2 |
| **Example:** | :LIMits:MOD:FM:UPPer:VALue 2.0Hz |
| | Sets Upper Limit Value for FM Deviation measurement to 2.0 Hz. |
| **Query Response:** | :LIMits:MOD:FM:UPPer:VALue? |
| | 1.0 |

> NOTE    Units defined by :CONFigure:MOD:ANALyzer:FM:UNIts command.

## 5.13 INBAND POWER MEASUREMENTS

### 5.13.1 Inband Power - Averages

**:METERs:POWer:CHn:INBand:AVERaging**
**:METERs:POWer:CHn:INBand:AVERaging?**

| | |
|---|---|
| **Description:** | Set command defines number of readings taken to calculate Average Inband Power measurement. |
| | Query command returns parameter setting. |
| **Range:** | 1 to 250 |
| **Default Value:** | 1 |
| **Set/Query Format:** | NR1 |
| **Example:** | :METERs:POWer:CH1:INBand:AVERaging 100 |
| | Sets the number of readings taken to calculate Channel 1 Inband Power measurements to 100. |
| **Query Response:** | :METERs:POWer:CH1:INBand:AVERaging? |
| | 100 |

NOTE    CHn = 1 or 2 (Channel 1 or 2).  Channel 2 is option enabled.

### 5.13.2 Inband Power - Average Measurement Reset

**:METERs:POWer:CHn:INBand:CLEAR:AVG**

| | |
|---|---|
| **Description:** | Command clears and resets Average Inband Power measurement. |
| **Parameter/Query:** | none |

NOTE    CHn = 1 or 2 (Channel 1 or 2).  Channel 2 is option enabled.

### 5.13.3 Inband Power - Lower Limit Enable

**:LIMits:POWer:CHn:INBand:LOWer:ENABle**
**:LIMits:POWer:CHn:INBand:LOWer:ENABle?**

| | |
|---|---|
| **Description:** | Set command Enables/Disables Lower Limit for Inband Power measurement. |
| | Query command returns parameter setting. |
| **Parameter:** | OFF \| ON \| 0 \| 1 |
| **Default Value:** | OFF |
| **Set/Query Format:** | Boolean |
| **Example:** | :LIMits:POWer:CH1:INBand:LOWer:ENABle ON |
| | Enables Lower Limit for Channel 1 Inband Power measurement. |
| **Query Response:** | :LIMits:POWer:CH1:INBand:LOWer:ENABle? |
| | 1 |

NOTE    CHn = 1 or 2 (Channel 1 or 2).  Channel 2 is option enabled.

### 5.13.4 Inband Power - Lower Limit Value

**:LIMits:POWer:CHn:INBand:LOWer:VALue**
**:LIMits:POWer:CHn:INBand:LOWer:VALue?**

| | |
|---|---|
| **Description:** | Set command defines Lower Limit Value for Inband Power measurement. |
| | Query command returns parameter setting. |
| **Range:** | -140.0 to +70.0 dBm |
| **Units:** | W \| dBW \| dBm \| V \| dBµV |
| **Default Value:** | 0.0 dBm |
| **Set/Query Format:** | NRf \| NR2 |
| **Example:** | :LIMits:POWer:CH1:INBand:LOWer:VALue -45dBm |
| | Sets Lower Limit for Channel 1 Inband measurements to -45.0 dBm. |
| **Query Response:** | :LIMits:POWer:CH1:INBand:LOWer:VALue? |
| | 0.0 |

NOTE    CHn = 1 or 2 (Channel 1 or 2).  Channel 2 is option enabled.

### 5.13.5 Inband Power - Measurement Query

**:METERs:POWer:CHn:INBand:STATus?**

| | |
|---|---|
| **Description:** | Command returns Inband Power measurement data. |
| **Query Data:** | <statusbyte>,<failbyte>,<precision>,<percentage>,<avg>,<max>,<min>,<units> |

NOTE    Refer to Chapter 1 for UUT Measurement Meter Return Data.

| | |
|---|---|
| **Query Response:** | :METERs:POWer:CH1:INBand:STATus? |
| | 0,0,3 100.00, -30.183, -30.140, -30.241,6 |

NOTE    CHn = 1 or 2 (Channel 1 or 2).  Channel 2 is option enabled.
Protocol must be defined as ANALOG to return valid measurement data.

### 5.13.6 Inband Power - Peak Measurement Reset

**:METERs:POWer:CHn:INBand:CLEAR:PEAK**

| | |
|---|---|
| **Description:** | Command clears and resets Peak Inband Power measurement. |
| **Parameter/Query:** | none |

NOTE    CHn = 1 or 2 (Channel 1 or 2).  Channel 2 is option enabled.

## 5.13.7 Inband Power - Units

**:METERs:POWer:INBand:UNIts**
**:METERs:POWer:INBand:UNIts?**

| | |
|---|---|
| **Description:** | Set command defines the unit of measurement for Inband Power measurement. |
| | Query command returns parameter setting. |
| **Parameter:** | dBm \| W \| dBW \| V \| dBµV |
| **Default Value:** | dBm |
| **Set/Query Format:** | CPD \| CRD |
| **Example:** | :METERs:POWer:INBand:UNIts W |
| | Displays Inband Power measurements in Watts. |
| **Query Response:** | :METERs:POWer:INBand:UNIts? |
| | W |

## 5.13.8 Inband Power - Upper Limit Enable

**:LIMits:POWer:CHn:INBand:UPPer:ENABle**
**:LIMits:POWer:CHn:INBand:UPPer:ENABle?**

| | |
|---|---|
| **Description:** | Set command Enables/Disables Upper Limit for Inband Power measurement. |
| | Query command returns parameter setting. |
| **Parameter:** | OFF \| ON \| 0 \| 1 |
| **Set/Query Format:** | Boolean |
| **Default Value:** | OFF |
| **Example:** | :LIMits:POWer:CH1:INBand:UPPer:ENABle ON |
| | Enables Upper Limit for Channel 1 Inband Power measurement. |
| **Query Response:** | :LIMits:POWer:CH1:INBand:UPPer:ENABle? |
| | 1 |

> **NOTE** CHn = 1 or 2 (Channel 1 or 2).  Channel 2 is option enabled.

## 5.13.9 Inband Power - Upper Limit Value

**:LIMits:POWer:CHn:INBand:UPPer:VALue**
**:LIMits:POWer:CHn:INBand:UPPer:VALue?**

| | |
|---|---|
| **Description:** | Set command defines the Upper Limit Value for Inband Power measurement Upper. |
| | Query command returns parameter setting. |
| **Range:** | -140.0 to +70.0 dBm |
| **Units:** | W \| dBW \| dBm \| V \| dBµV |
| **Default Value:** | 0.0 dBm |
| **Set/Query Format:** | NRf \| NR2 |
| **Example:** | :LIMits:POWer:CH1:INBand:UPPer:VALue -25dBm |
| | Sets Upper Limit for Channel 1 Inband Power Measurement to -25.0 dBm. |
| **Query Response:** | :LIMits:POWer:CH1:INBand:UPPer:VALue? |
| | 0.0 |

> **NOTE** CHn = 1 or 2 (Channel 1 or 2).  Channel 2 is option enabled.

## 5.14    MODULATION DISTORTION MEASUREMENTS

### 5.14.1    Modulation Distortion - Averages

**:CONFigure:MOD:ANALyzer:DISTortion:AVERage**
**:CONFigure:MOD:ANALyzer:DISTortion:AVERage?**

| | |
|---|---|
| **Description:** | Set command defines number of readings taken to calculate Average Modulation Distortion measurement. |
| | Query command returns parameter setting. |
| **Range:** | 1 to 250 |
| **Default Value:** | 1 |
| **Set/Query Format:** | NR1 |
| **Example:** | :CONFigure:MOD:ANALyzer:DISTortion:AVERage 75 |
| | Sets number of readings taken to calculate Average Modulation Distortion measurement to 75. |
| **Query Response:** | :CONFigure:MOD:ANALyzer:DISTortion:AVERage? |
| | 75 |

### 5.14.2    Modulation Distortion - Average Measurement Reset

**:MOD:ANALyzer:DISTortion:CLEAR:AVG**

| | |
|---|---|
| **Description:** | Command clears and resets Average Modulation Distortion measurement. |
| **Parameter/Query:** | none |

### 5.14.3    Modulation Distortion - Lower Limit Enable

**:LIMits:MOD:DISTortion:LOWer:ENABle**
**:LIMits:MOD:DISTortion:LOWer:ENABle?**

| | |
|---|---|
| **Description:** | Set command Enables/Disables Lower Limit for Modulation Distortion measurement. |
| | Query command returns parameter setting. |
| **Parameter:** | OFF \| ON \| 0 \| 1 |
| **Default Value:** | OFF |
| **Set/Query Format:** | Boolean |
| **Example:** | :LIMits:MOD:DISTortion:LOWer:ENABle ON |
| | Enables Lower Limit for Modulation Distortion measurement. |
| **Query Response:** | :LIMits:MOD:DISTortion:LOWer:ENABle? |
| | 1 |

### 5.14.4 Modulation Distortion - Lower Limit Value

**:LIMits:MOD:DISTortion:LOWer:VALue**
**:LIMits:MOD:DISTortion:LOWer:VALue?**

| | |
|---|---|
| **Description:** | Set command defines Lower Limit Value for Modulation Distortion measurement. |
| | Query command returns parameter setting. |
| **Range:** | 0.0 to 100.0% |
| **Units:** | % (percent) |
| **Default Value:** | 0.0% |
| **Set/Query Format:** | NRf \| NR2 |
| **Example:** | :LIMits:MOD:DISTortion:LOWer:VALue 1.0 |
| | Sets Lower Limit Value for Modulation Distortion measurement to 1.0%. |
| **Query Response:** | :LIMits:MOD:DISTortion:LOWer:VALue? |
| | 1.0 |

### 5.14.5 Modulation Distortion - Measurement Query

**:FETCh:MOD:ANALyzer:DISTortion?**

| | |
|---|---|
| **Description:** | Command returns Modulation Distortion measurement data. |
| **Query Data:** | <statusbyte>,<failbyte>,<avgvount>,<avg%>,<wc%> |

| NOTE | Refer to Chapter 1 for UUT Measurement Meter Return Data. |
|---|---|

| | |
|---|---|
| **Query Response:** | :FETCh:MOD:ANALyzer:DISTortion? |
| | 0,0,1,99.59,99.99 |

| NOTE | Protocol must be defined as Analog to obtain valid Modulation Distortion measurements data. |
|---|---|

### 5.14.6 Modulation Distortion - Peak Measurement Reset

**:MOD:ANALyzer:DISTortion:CLEAR:PEAK**

| | |
|---|---|
| **Description:** | Command clears and resets Peak Modulation Distortion measurement. |
| **Parameter/Query:** | none |

### 5.14.7 Modulation Distortion - Upper Limit Enable

**:LIMits:MOD:DISTortion:UPPer:ENABle**
**:LIMits:MOD:DISTortion:UPPer:ENABle?**

| | |
|---|---|
| **Description:** | Set command Enables/Disables Upper Limit for Modulation Distortion measurement. |
| | Query command returns parameter setting. |
| **Parameter:** | OFF \| ON \| 0 \| 1 |
| **Default Value:** | OFF |
| **Set/Query Format:** | Boolean |
| **Example:** | :LIMits:MOD:DISTortion:UPPer:ENABle ON |
| | Enables Upper Limit for Modulation Distortion measurement. |
| **Query Response:** | :LIMits:MOD:DISTortion:UPPer:ENABle? |
| | 1 |

### 5.14.8 Modulation Distortion - Upper Limit Value

**:LIMits:MOD:DISTortion:UPPer:VALue**
**:LIMits:MOD:DISTortion:UPPer:VALue?**

| | |
|---:|:---|
| **Description:** | Set command defines Upper Limit Value for Modulation Distortion measurement. |
| | Query command returns parameter setting. |
| **Range:** | 0.0 to 100.0% |
| **Units:** | % (percent) |
| **Default Value:** | 0.0% |
| **Set/Query Format:** | NRf \| NR2 |
| **Example:** | :LIMits:MOD:DISTortion:UPPer:VALue 1.0 |
| | Sets Upper Limit Value for Modulation Distortion measurements to 1.0%. |
| **Query Response:** | :LIMits:MOD:DISTortion:UPPer:VALue? |
| | 1.0 |

## 5.15 MODULATION FREQUENCY MEASUREMENTS

### 5.15.1 Modulation Frequency - Averages

**:CONFigure:MOD:ANALyzer:FREQuency:AVERage**
**:CONFigure:MOD:ANALyzer:FREQuency:AVERage?**

| | |
|---|---|
| **Description:** | Set command defines number of readings taken to calculate average Modulation Frequency measurement. |
| | Query command returns parameter setting. |
| **Range:** | 1 to 250 |
| **Default Value:** | 1 |
| **Set/Query Format:** | NR1 |
| **Example:** | :CONFigure:MOD:ANALyzer:FREQuency:AVERage 75 |
| | Sets number of readings taken to calculate Average Modulation Frequency measurement to 75. |
| **Query Response:** | :CONFigure:MOD:ANALyzer:FREQuency:AVERage? |
| | 75 |

### 5.15.2 Modulation Frequency - Average Measurement Reset

**:MOD:ANALyzer:FREQuency:CLEAR:AVG**

| | |
|---|---|
| **Description:** | Command clears and resets Average Modulation Frequency measurement. |
| **Parameter/Query:** | none |

### 5.15.3 Modulation Frequency - Lower Limit Enable

**:LIMits:MOD:FREQuency:LOWer:ENABle**
**:LIMits:MOD:FREQuency:LOWer:ENABle?**

| | |
|---|---|
| **Description:** | Set command Enables/Disables Lower Limit for Modulation Frequency measurement. |
| | Query command returns parameter setting. |
| **Parameter:** | OFF \| ON \| 0 \| 1 |
| **Set/Query Format:** | Boolean |
| **Default Value:** | OFF |
| **Example:** | :LIMits:MOD:FREQuency:LOWer:ENABle ON |
| | Enables Lower Limit for Modulation Frequency measurement. |
| **Query Response:** | :LIMits:MOD:FREQuency:LOWer:ENABle? |
| | 1 |

### 5.15.4     Modulation Frequency - Lower Limit Value

**:LIMits:MOD:FREQuency:LOWer:VALue**
**:LIMits:MOD:FREQuency:LOWer:VALue?**

| | |
|---|---|
| **Description:** | Set command defines the Lower Limit Value Modulation Frequency measurement. |
| | Query command returns parameter setting. |
| **Range:** | 0.0 Hz to 20.0 kHz |
| **Units:** | Hz \| kHz |
| **Default Value:** | 0.0 kHz |
| **Set/Query Format:** | NRf \| NR2 |
| **Example:** | :LIMits:MOD:FREQuency:LOWer:VALue 1.0Hz |
| | Sets Lower Limit Value for Modulation Frequency measurement to 1.0 Hz. |
| **Query Response:** | :LIMits:MOD:FREQuency:LOWer:VALue? |
| | 1.0 |

### 5.15.5     Modulation Frequency - Measurement Query

**:FETCh:MOD:ANALyzer:FREQuency?**

| | |
|---|---|
| **Description:** | Command returns Modulation Frequency measurement data. |
| **Query Data:** | <statusbyte>, <avgcount>, <avg(Hz)> |

| NOTE | Refer to Chapter 1 for UUT Measurement Meter Return Data. |
|---|---|

| | |
|---|---|
| **Query Response:** | :FETCh:MOD:ANALyzer:FREQuency? |
| | 0,0,2979.00 |

| NOTE | Protocol must be defined as Analog to obtain valid Modulation Frequency measurement data. |
|---|---|

### 5.15.6     Modulation Frequency - Peak Measurement Reset

**:MOD:ANALyzer:FREQuency:CLEAR:PEAK**

| | |
|---|---|
| **Description:** | Command clears and resets Peak Modulation Frequency measurement. |
| **Parameter/Query:** | none |

### 5.15.7     Modulation Frequency - Sub-Audible Deviation Filter

**:CONFigure:MOD:ANALyzer:SAUDDEV:FILter**
**:CONFigure:MOD:ANALyzer:SAUDDEV:FILter?**

| | |
|---|---|
| **Description:** | Set command  selects Sub-Audible filter to include in Demod Frequency path. |
| | Query command returns parameter setting. |
| **Parameter:** | HP300HZ \| LP300HZ |
| **Default Value:** | 300 Hz HP |
| **Set/Query Format:** | CPD \| CRD |
| **Example:** | :CONFigure:MOD:ANALyzer:SAUDDEV:FILter LP300HZ |
| | Selects 300 Hz LP Sub-Audible Filter for Demod Frequency path. |
| **Query Response:** | :CONFigure:MOD:ANALyzer:SAUDDEV:FILter? |
| | LP300HZ |

| NOTE | This command is only valid for SmartNet™/SmartZone™ protocol when configured for Analog Modulation. |
|---|---|

### 5.15.8    Modulation Frequency - Upper Limit Enable

**:LIMits:MOD:FREQuency:UPPer:ENABle**
**:LIMits:MOD:FREQuency:UPPer:ENABle?**

| | |
|---|---|
| **Description:** | Set command Enables/Disables Upper Limit for Modulation Frequency measurement. |
| | Query command returns parameter setting. |
| **Parameter:** | OFF \| ON \| 0 \| 1 |
| **Set/Query Format:** | Boolean |
| **Default Value:** | OFF |
| **Example:** | :LIMits:MOD:FREQuency:UPPer:ENABle ON |
| | Enables Upper Limit for Modulation Frequency measurement. |
| **Query Response:** | :LIMits:MOD:FREQuency:UPPer:ENABle? |
| | 1 |

### 5.15.9    Modulation Frequency - Upper Limit Value

**:LIMits:MOD:FREQuency:UPPer:VALue**
**:LIMits:MOD:FREQuency:UPPer:VALue?**

| | |
|---|---|
| **Description:** | Set command defines the Upper Limit Value for Modulation Frequency measurement. |
| | Query command returns parameter setting. |
| **Range:** | 0.0 Hz to 20.0 kHz |
| **Units:** | Hz \| kHz |
| **Default Value:** | 0.0 Hz |
| **Set/Query Format:** | NRf \| NR2 |
| **Example:** | :LIMits:MOD:FREQuency:UPPer:VALue 2.0Hz |
| | Sets Upper Limit Value for Modulation Frequency measurement to 2.0 Hz. |
| **Query Response:** | :LIMits:MOD:FREQuency:UPPer:VALue? |
| | 1.0 |

## 5.16    MODULATION HUM & NOISE MEASUREMENTS

### 5.16.1    Mod Hum & Noise - Averages

**:CONFigure:MOD:ANALyzer:HN:AVERage**
**:CONFigure:MOD:ANALyzer:HN:AVERage?**

|                      |                                                                                      |
|---------------------:|--------------------------------------------------------------------------------------|
| **Description:**     | Set command defines number of readings taken to calculate the Average Mod Hum & Noise measurement. |
|                      | Query command returns parameter setting.                                             |
| **Range:**           | 1 to 250                                                                             |
| **Default Value:**   | 1                                                                                    |
| **Set/Query Format:**| NR1                                                                                  |
| **Example:**         | :CONFigure:MOD:ANALyzer:HN:AVERage 75                                                |
|                      | Sets number of readings taken to calculate Average Mod Distortion measurement to 75. |
| **Query Response:**  | :CONFigure:MOD:ANALyzer:HN:AVERage?                                                  |
|                      | 75                                                                                   |

### 5.16.2

### 5.16.3    Mod Hum & Noise - Average Measurement Reset

**:MOD:ANALyzer:HN:CLEAR:AVG**

|                      |                                                                  |
|---------------------:|------------------------------------------------------------------|
| **Description:**     | Command clears and resets Average Mod Hum & Noise measurement.   |
| **Parameter/Query:** | none                                                             |

### 5.16.4    Mod Hum & Noise - Lower Limit Enable

**:LIMits:MOD:HN:LOWer:ENABle**
**:LIMits:MOD:HN:LOWer:ENABle?**

|                      |                                                                      |
|---------------------:|----------------------------------------------------------------------|
| **Description:**     | Set command Enables/Disables Lower Limit for Mod Hum & Noise measurement. |
|                      | Query command returns parameter setting.                             |
| **Parameter:**       | OFF \| ON \| 0 \| 1                                                  |
| **Default Value:**   | OFF                                                                  |
| **Set/Query Format:**| Boolean                                                             |
| **Example:**         | :LIMits:MOD:HN:LOWer:ENABle ON                                      |
|                      | Enables Lower Limit for Mod Hum & Noise measurement.                 |
| **Query Response:**  | :LIMits:MOD:HN:LOWer:ENABle?                                        |
|                      | 1                                                                    |

## 5.16.5 Mod Hum & Noise - Lower Limit Value

**:LIMits:MOD:HN:LOWer:VALue**
**:LIMits:MOD:HN:LOWer:VALue?**

| | |
|---|---|
| **Description:** | Set command defines Lower Limit Value for Mod Hum & Noise measurement. Query command returns parameter setting. |
| **Range:** | -100.0 to +100.0 dBr |
| **Units:** | dBr |
| **Default Value:** | 0.0 dBr |
| **Set/Query Format:** | NRf \| NR1 |
| **Example:** | :LIMits:MOD:HN:LOWer:VALue -50dBr |
| | Sets Lower Limit Value for Mod Hum & Noise measurement to -50.0 dBr. |
| **Query Response:** | :LIMits:MOD:HN:LOWer:VALue? |
| | -50 |

## 5.16.6 Mod Hum & Noise - Measurement Query

**:FETCh:MOD:ANALyzer:HN?**

| | |
|---|---|
| **Description:** | Command returns Mod and Noise measurement data. |
| **Query Data:** | \<statusbyte\>,\<failbyte\>,\<avgcount\>,\<avg(dB)\>,\<wc(dB)\> |
| **NOTE** | Refer to Chapter 1 for UUT Measurement Meter Return Data. |
| **Query Response:** | :FETCh:MOD:ANALyzer:HN? |
| | 4,4,13,62.35,75.68 |
| **NOTE** | Mod Analyzer Noise measurement type must be defined as Signal to Noise Ratio (:MOD:ANALyzer:NTYPe SN) and SNR measurement defined as Hum & Noise (:CONFigure:MOD:ANALyzer:SNR:MODE 0) to obtain valid Hum & Noise measurement. |

## 5.16.7 Mod Hum & Noise - Peak Measurement Reset

**:MOD:ANALyzer:HN:CLEAR:PEAK**

| | |
|---|---|
| **Description:** | Command clears and resets Peak Mod Hum & Noise measurement. |
| **Parameter/Query:** | none |

## 5.16.8 Mod Hum & Noise - Reference Lock

**:CONFigure:MOD:ANALyzer:HN:REFerence**

| | |
|---|---|
| **Description:** | Command locks Mod Hum and Noise reference to current meter reading. |
| **Parameter/Query:** | none |
| **NOTE** | SNR measurement must be defined as Hum & Noise to obtain valid Hum & Noise measurement (:CONFigure:MOD:ANALyzer:SNR:MODE HN). |

### 5.16.9        Mod Hum & Noise - Reference Value

**:CONFigure:MOD:ANALyzer:HN:REFerence:VALue**
**:CONFigure:MOD:ANALyzer:HN:REFerence:VALue?**

| | |
|---|---|
| **Description:** | Set command defines the reference for Modulation Analyzer Hum and Noise measurement. |
| | Query command returns parameter setting. |
| **Range:** | -100.0 to +100.0 dB |
| **Units:** | dB |
| **Default Value:** | 12.0 dB |
| **Set/Query Format:** | NRf \| NR2 |
| **Example:** | :CONFigure:MOD:ANALyzer:HN:REFerence:VALue 1dB |
| | Sets Hum & Noise Reference value to 1.0 dB. |
| **Query Response:** | :CONFigure:MOD:ANALyzer:HN:REFerence:VALue? |
| | 1 |

### 5.16.10        Mod Hum & Noise - Upper Limit Enable

**:LIMits:MOD:HN:UPPer:ENABle**
**:LIMits:MOD:HN:UPPer:ENABle?**

| | |
|---|---|
| **Description:** | Set command Enables/Disables Upper Limit for Mod Hum & Noise measurement. |
| | Query command returns parameter setting. |
| **Parameter:** | OFF \| ON \| 0 \| 1 |
| **Default Value:** | OFF |
| **Set/Query Format:** | Boolean |
| **Example:** | :LIMits:MOD:HN:UPPer:ENABle ON |
| | Enables Upper Limit for Mod Hum & Noise measurement. |
| **Query Response:** | :LIMits:MOD:HN:UPPer:ENABle? |
| | 1 |

### 5.16.11        Mod Hum & Noise - Upper Limit Value

**:LIMits:MOD:HN:UPPer:VALue**
**:LIMits:MOD:HN:UPPer:VALue?**

| | |
|---|---|
| **Description:** | Set command defines Upper Limit Value for Hum and Noise measurement. |
| | Query command returns parameter setting. |
| **Range:** | -100.0 to +100.0 dBr |
| **Units:** | dBr |
| **Default Value:** | 10.0 dBr |
| **Set/Query Format:** | NRf \| NR1 |
| **Example:** | :LIMits:MOD:HN:UPPer:VALue 75dBr |
| | Sets Upper Limit Value for Mod Hum & Noise measurement to 75.0 dBr. |
| **Query Response:** | :LIMits:MOD:HN:UPPer:VALue? |
| | 75 |

## 5.17    MODULATION SINAD MEASUREMENTS

### 5.17.1    Modulation Sinad - Averages

**:CONFigure:MOD:ANALyzer:SINad:AVERage**
**:CONFigure:MOD:ANALyzer:SINad:AVERage?**

| | |
|---|---|
| **Description:** | Set command defines number of readings taken to calculate the Average Modulation Sinad measurement. |
| | Query command returns parameter setting. |
| **Range:** | 1 to 250 |
| **Default Value:** | 1 |
| **Set/Query Format:** | NR1 |
| **Example:** | :CONFigure:MOD:ANALyzer:SINad:AVERage 25 |
| | Sets number of readings taken to calculate Average Modulation Sinad measurement to 75. |
| **Query response:** | :CONFigure:MOD:ANALyzer:SINad:AVERage? |
| | 75 |

### 5.17.2    Modulation Sinad - Average Measurement Reset

**:MOD:ANALyzer:SINad:CLEAR:AVG**

| | |
|---|---|
| **Description:** | Command clears and resets Average Modulation Sinad measurement. |
| **Parameter/Query:** | none |

### 5.17.3    Modulation Sinad - Lower Limit Enable

**:LIMits:MOD:SINad:LOWer:ENABle**
**:LIMits:MOD:SINad:LOWer:ENABle?**

| | |
|---|---|
| **Description:** | Set command Enables/Disables Lower Limit for Modulation Sinad measurement. |
| | Query command returns parameter setting. |
| **Parameter:** | OFF \| ON \| 0 \| 1 |
| **Set/Query Format:** | Boolean |
| **Default Value:** | OFF |
| **Example** | :LIMits:MOD:SINad:LOWer:ENABle ON |
| | Enables Lower Limit for Modulation Sinad measurement. |
| **Query Response:** | :LIMits:MOD:SINad:LOWer:ENABle? |
| | 1 |

### 5.17.4     Modulation Sinad - Lower Limit Value

**:LIMits:MOD:SINad:LOWer:VALue**
**:LIMits:MOD:SINad:LOWer:VALue?**

| | |
|---|---|
| **Description:** | Set command defines Lower Limit Value for Modulation Sinad measurement. Query command returns parameter setting. |
| **Range:** | 0.0 to 100.0 dB |
| **Units:** | dB |
| **Default Value:** | 26.0 dB |
| **Set/Query Format:** | NRf \| NR1 |
| **Example:** | :LIMits:MOD:SINad:LOWer:VALue 30dB |
| | Sets Lower Limit for Modulation Sinad measurement to 30 dB. |
| **Query Response:** | :LIMits:MOD:SINad:LOWer:VALue? |
| | 30 |

### 5.17.5     Modulation Sinad - Measurement Query

**:FETCh:MOD:ANALyzer:SINad?**

| | |
|---|---|
| **Description:** | Command returns Modulation Sinad measurement data. |
| **Query Data:** | <statusbyte>,<failbyte>,<avgcount>,<avg(dB)>,<wc(dB)> |
| **NOTE** | Refer to Chapter 1 for UUT Measurement Meter Return Data. |
| **Query Response:** | :FETCh:MOD:ANALyzer:SINad? |
| | 0,0,1,0.15,0.19 |
| **NOTE** | Protocol must be defined as Analog to return valid measurement data. |

### 5.17.6     Modulation Sinad - Peak Measurement Reset

**:MOD:ANALyzer:SINad:CLEAR:PEAK**

| | |
|---|---|
| **Description:** | Command clears and resets Peak Modulation Sinad measurement. |
| **Parameter/Query:** | none |

### 5.17.7     Modulation Sinad - Upper Limit Enable

**:LIMits:MOD:SINad:UPPer:ENABle**
**:LIMits:MOD:SINad:UPPer:ENABle?**

| | |
|---|---|
| **Description:** | Set command Enables/Disables Upper Limit for Modulation Sinad measurement. Query command returns parameter setting. |
| **Parameter:** | OFF \| ON \| 0 \| 1 |
| **Default Value:** | OFF |
| **Set/Query Format:** | Boolean |
| **Example** | :LIMits:MOD:SINad:UPPer:ENABle ON |
| | Enables Upper Limit for Modulation Sinad measurement. |
| **Query Response:** | :LIMits:MOD:SINad:UPPer:ENABle? |
| | 1 |

### 5.17.8 Modulation Sinad - Upper Limit Value

**:LIMits:MOD:SINad:UPPer:VALue**
**:LIMits:MOD:SINad:UPPer:VALue?**

| | |
|---|---|
| **Description:** | Set command defines the Upper Limit Value for Modulation Sinad measurement. Query command returns parameter setting. |
| **Range:** | 0.0 to 100.0 dB |
| **Units:** | dB |
| **Default Value:** | 26.0 dB |
| **Set/Query Format:** | NRf \| NR1 |
| **Example:** | :LIMits:MOD:SINad:UPPer:VALue 30dB |
| | Sets Upper Limit Value for Modulation Sinad measurement to 30 dB. |
| **Query Response:** | :LIMits:MOD:SINad:UPPer:VALue? |
| | 30 |

## 5.18    MODULATION SNR MEASUREMENTS

### 5.18.1      Mod SNR - Averages

**:CONFigure:MOD:ANALyzer:SNR:AVERage**
**:CONFigure:MOD:ANALyzer:SNR:AVERage?**

| | |
|---|---|
| **Description:** | Set command defines number of readings taken to calculate Average Mod Signal to Noise Ratio measurement. |
| | Query command returns parameter setting. |
| **Range:** | 1 to 250 |
| **Default Value:** | 1 |
| **Set/Query Format:** | NR1 |
| **Example:** | :CONFigure:MOD:ANALyzer:SNR:AVERage 75 |
| | Sets number of readings taken to calculate Average Mod SNR measurement to 75. |
| **Query Response:** | :CONFigure:MOD:ANALyzer:SNR:AVERage? |
| | 75 |

### 5.18.2      Mod SNR - Average Measurement Reset

**:MOD:ANALyzer:SNR:CLEAR:AVG**

| | |
|---|---|
| **Description:** | Command clears and resets Average Mod SNR measurement. |
| **Parameter/Query:** | none |

### 5.18.3      Mod SNR - Lower Limit Enable

**:LIMits:MOD:SNR:LOWer:ENABle**
**:LIMits:MOD:SNR:LOWer:ENABle?**

| | |
|---|---|
| **Description:** | Set command Enables/Disables Lower Limit for Mod SNR measurement. |
| | Query command returns parameter setting. |
| **Parameter:** | OFF \| ON \| 0 \| 1 |
| **Default Value:** | OFF |
| **Set/Query Format:** | Boolean |
| **Example:** | :LIMits:MOD:SNR:LOWer:ENABle ON |
| | Enables Lower Limit for Mod SNR measurement. |
| **Query Response:** | :LIMits:MOD:SNR:LOWer:ENABle? |
| | 1 |

## 5.18.4 Mod SNR - Lower Limit Value

**:LIMits:MOD:SNR:LOWer:VALue**
**:LIMits:MOD:SNR:LOWer:VALue?**

| | |
|---|---|
| **Description:** | Set command defines the Lower Limit Value for Mod SNR measurement. |
| | Query command returns parameter setting. |
| **Range:** | -100.0 to +100.0 dBr |
| **Units:** | dBr |
| **Default Value:** | 26.0 dBr |
| **Set/Query Format:** | NRf \| NR2 |
| **Example:** | :LIMits:MOD:SNR:LOWer:VALue 50dBr |
| | Sets Lower Limit for Mod SNR measurement to 50.0 dBr. |
| **Query Response:** | :LIMits:MOD:SNR:LOWer:VALue? |
| | 50 |

## 5.18.5 Mod SNR - Mode

**:CONFigure:MOD:ANALyzer:SNR:MODE**
**:CONFigure:MOD:ANALyzer:SNR:MODE?**

| | |
|---|---|
| **Description:** | Set command defines the SNR Meter Mode (Normal or Hum and Noise) when performing Signal to Noise Ratio measurement. |
| | Query command returns parameter setting. |
| **Parameter:** | 0 = Hum & Noise |
| | 1 = Normal |
| **Default Value:** | 0 (Hum & Noise) |
| **Set/Query Format:** | NR1 |
| **Example:** | :CONFigure:MOD:ANALyzer:SNR:MODE 0 |
| | Sets Mod SNR measurement to Hum & Noise. |
| **Query Response:** | :CONFigure:MOD:ANALyzer:SNR:MODE? |
| | 0 |

## 5.18.6 Mod SNR - Measurement Query

**:FETCh:MOD:ANALyzer:SNR?**

| | |
|---|---|
| **Description:** | Command returns Modulation Signal to Noise Ratio measurement data. |
| **Query Data:** | <statusbyte>,<failbyte>,<avg(dB)>,<wc(dB)> |
| NOTE | Refer to Chapter 1 for UUT Measurement Meter Return Data. |
| **Query Response:** | :FETCh:MOD:ANALyzer:SNR? |
| | 0,2,1,-0.00,13.02 |
| NOTE | Mod Analyzer Noise measurement type must be defined as SNR to return valid Mod SNR measurement data (:MOD:ANALyzer:NTYPe SN.) |
| | (*rci meter mode compatible: see :SYSTem:RCI :METER:MODE) |

### 5.18.7        Mod SNR - Peak Measurement Reset

**:MOD:ANALyzer:SNR:CLEAR:PEAK**

     **Description:**   Command clears and resets Peak Mod SNR measurement.

**Parameter/Query:**   none

### 5.18.8        Mod SNR - Upper Limit Enable

**:LIMits:MOD:SNR:UPPer:ENABle**
**:LIMits:MOD:SNR:UPPer:ENABle?**

     **Description:**   Set command Enables/Disables Upper Limit for Mod SNR measurement.
                      Query command returns parameter setting.

      **Parameter:**   OFF | ON | 0 | 1

**Default Value:**   OFF

**Set/Query Format:**   Boolean

       **Example:**   :LIMits:MOD:SNR:UPPer:ENABle ON
                      Enables Upper Limit for Mod SNR measurement.

**Query Response:**   :LIMits:MOD:SNR:UPPer:ENABle?
                      1

### 5.18.9        Mod SNR - Upper Limit Value

**:LIMits:MOD:SNR:UPPer:VALue**
**:LIMits:MOD:SNR:UPPer:VALue?**

     **Description:**   Set command defines the Upper Limit Value for Mod SNR measurement.
                      Query command returns parameter setting.

         **Range:**   -100.0 to +100.0 dBr

         **Units:**   dBr

**Default Value:**   0.0 dBr

**Set/Query Format:**   NRf | NR2

       **Example:**   :LIMits:MOD:SNR:UPPer:VALue 50dBr
                      Sets Upper Limit Value for Mod SNR measurement to 50.0 dBr.

**Query Response:**   :LIMits:MOD:SNR:UPPer:VALue?
                      50

## 5.19    RF ERROR MEASUREMENTS

### 5.19.1    RF Error - Averages

**:CONFigure:RF:ANALyzer:RFERRor:AVERage**
**:CONFigure:RF:ANALyzer:RFERRor:AVERage?**

|  |  |
|---|---|
| **Description:** | Set command defines number of readings taken to calculate Average RF Error measurement. |
| | Query command returns parameter setting. |
| **Range:** | 1 to 250 |
| **Default Value:** | 1 |
| **Set/Query Format:** | NR1 |
| **Example:** | :CONFigure:RF:ANALyzer:RFERRor:AVERage 75 |
| | Sets number of readings taken to calculate Average RF Error measurement to 75. |
| **Query Response:** | :CONFigure:RF:ANALyzer:RFERRor:AVERage? |
| | 75 |

### 5.19.2    RF Error - Average Measurement Reset

**:RF:ANALyzer:RFERRor:CLEAR:AVG**

|  |  |
|---|---|
| **Description:** | Command clears and resets Average RF Error measurement. |
| **Parameter/Query:** | none |

### 5.19.3    RF Error - Frequency Resolution Value

**:CONFigure:RF:ANALyzer:RFERRor:FRESolution**
**:CONFigure:RF:ANALyzer:RFERRor:FRESolution?**

|  |  |
|---|---|
| **Description:** | Set command defines RF Error Frequency Resolution. |
| | Query command returns parameter setting. |
| **Parameter:** | 1 \| 10 |
| **Units:** | Hz |
| **Default Value:** | 1 Hz |
| **Set/Query Format:** | NRf \| NR1 |
| **Example:** | :CONFigure:RF:ANALyzer:RFERRor:FRESolution 10 |
| | Sets RF Error Frequency Resolution to 10 Hz. |
| **Query Response:** | :CONFigure:RF:ANALyzer:RFERRor:FRESolution? |
| | 10 |

## 5.19.4    RF Error - Lower Limit Enable

**:LIMits:RF:RFERRor:LOWer:ENABle**
**:LIMits:RF:RFERRor:LOWer:ENABle?**

| | |
|---|---|
| **Description:** | Set command Enables/Disables Lower Limit for RF Error measurement. Query command returns parameter setting. |
| **Parameter:** | OFF \| ON \| 0 \| 1 |
| **Default Value:** | OFF |
| **Set/Query Format:** | Boolean |
| **Example:** | :LIMits:RF:RFERRor:LOWer:ENABle ON |
| | Enables Lower Limit for RF Error measurement. |
| **Query Response:** | :LIMits:RF:RFERRor:LOWer:ENABle? |
| | 1 |

## 5.19.5    RF Error - Lower Limit Value

**:LIMits:RF:RFERRor:LOWer:VALue**
**:LIMits:RF:RFERRor:LOWer:VALue?**

| | |
|---|---|
| **Description:** | Set command defines the Lower Limit Value for RF Error measurement. Query command returns parameter setting. |
| **Range:** | -5000000.0 to +5000000.0 Hz |
| | PPM: 0 to 1000 |
| **Units:** | Hz \| PPM |
| **Default Value:** | 0.0 Hz |
| **Set/Query Format:** | NRf \| NR2 (Hz) |
| **Command Example:** | :LIMits:RF:RFERRor:LOWer:VALue 1000Hz |
| | Sets Lower Limit Value for RF Error measurement to 1000.0 Hz. |
| **Query Response:** | :LIMits:RF:RFERRor:LOWer:VALue? |
| | 1000 |

## 5.19.6    RF Error - Measurement Query

**:FETCh:RF:ANALyzer:RFERRor?**

| | |
|---|---|
| **Description:** | Command returns RF Error measurement data. |
| **Query Data:** | <statusbyte>,<failbyte>,<avgcount>,<avg(dB)>,<max(dB)> |
| NOTE | Refer to Chapter 1 for UUT Measurement Meter Return Data. |
| **Query Response:** | :FETCh:RF:ANALyzer:RFERRor? |
| | 0,0,1,874.77,2437.64 |

## 5.19.7    RF Error - Peak Measurement Reset

**:RF:ANALyzer:RFERRor:CLEAR:PEAK**

| | |
|---|---|
| **Description:** | Command clears and resets Peak RF Error measurement. |
| **Parameter/Query:** | none |

### 5.19.8    RF Error - Units

**:CONFigure:RF:ANALyzer:RFERRor:UNIts**
**:CONFigure:RF:ANALyzer:RFERRor:UNIts?**

| | |
|---|---|
| **Description:** | Set command defines the unit of measurement for RF Error measurement. |
| | Query command returns parameter setting. |
| **Parameter:** | Hz \| PPM |
| **Default Value:** | Hz |
| **Set/Query Format:** | CPD \| CRD |
| **Example:** | :CONFigure:RF:ANALyzer:RFERRor:UNIts PPM |
| | Displays RF Error measurement in PPM. |
| **Query Response:** | :CONFigure:RF:ANALyzer:RFERRor:UNIts? |
| | PPM |

### 5.19.9    RF Error - Upper Limit Enable

**:LIMits:RF:RFERRor:UPPer:ENABle**
**:LIMits:RF:RFERRor:UPPer:ENABle?**

| | |
|---|---|
| **Description:** | Set command Enables/Disables Upper Limit for RF Error measurement. |
| | Query command returns parameter setting. |
| **Parameter:** | OFF \| ON \| 0 \| 1 |
| **Default Value:** | OFF |
| **Set/Query Format:** | Boolean |
| **Example:** | :LIMits:RF:RFERRor:UPPer:ENABle ON |
| | Enables Upper Limit for RF Error measurement. |
| **Query Response:** | :LIMits:RF:RFERRor:UPPer:ENABle? |
| | 1 |

### 5.19.10    RF Error - Upper Limit Value

**:LIMits:RF:RFERRor:UPPer:VALue**
**:LIMits:RF:RFERRor:UPPer:VALue?**

| | |
|---|---|
| **Description:** | Set command defines the Upper Limit Value for RF Error measurement. |
| | Query command returns the Upper Limit Value defined for RF Error measurement. |
| **Range:** | Hz: -5000000.0 to +5000000.0 |
| | PPM: 0 to 1000 |
| **Default Value:** | 0.0 Hz |
| **Set/Query Format:** | NRf \| NR2 |
| **Example:** | :LIMits:RF:RFERRor:UPPer:VALue 1000Hz |
| | Sets Upper Limit Value for RF Error measurements to 1000.0 Hz. |
| **Query Response:** | :LIMits:RF:RFERRor:UPPer:VALue? |
| | 1000 |

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# Chapter 6 - Modulation Accuracy and Power
# Remote Commands

## 6.1      INTRODUCTION

This chapter describes the Remote Commands used for configuring and obtaining dPMR Modulation Accuracy and Power measurements. Remote Commands are listed alphabetically under Tile headings.

## 6.2      CONSTELLATION GRAPH

### 6.2.1      Constellation - Persistence

**:CONStellation:PERSistence**
**:CONStellation:PERSistence?**

| | |
|---|---|
| **Description:** | Set command sets Persistence on Constellation graph. |
| | Query command returns parameter setting. |
| **Range:** | 1 to 10 |
| **Default Value:** | 1 |
| **Set/Query Format:** | NR1 |
| **Example:** | :CONStellation:PERSistence 5 |
| | Sets Constellation Graph Persistence to 5. |
| **Query Response:** | :CONStellation:PERSistence? |
| | 5 |

### 6.2.2      Constellation - Trace Enable

**:CONStellation:TRACe:ENABle**
**:CONStellation:TRACe:ENABle?**

| | |
|---|---|
| **Description:** | Set command Enables/Disables Constellation trace. |
| | Query command returns parameter setting. |
| **Parameter:** | OFF \| ON \| 0 \| 1 |
| **Default Value:** | OFF |
| **Set/Query Format:** | Boolean |
| **Example:** | :CONStellation:TRACe:ENABle ON |
| | Enables Constellation trace. |
| **Query Response:** | :CONStellation:TRACe:ENABle? |
| | 1 |

| NOTE | Trace must be enabled (ON) to return valid data. |
|---|---|

## 6.2.3 Constellation - Trace Data Query

### :CONStellation:TRACe:FETCh?

| | |
|---|---|
| **Description:** | Command returns Constellation trace data. |
| **Query Data:** | <statusbyte>,<#pairs>,<x data>,<y data>,<status message> |
| **statusbyte (NR1):** | 0 = Invalid |
| | 1 = Valid |
| | 2 = Inaccurate |
| **#pairs (NR1):** | Number of x,y coordinate pairs to follow |
| **x, y data (NR2):** | coordinate value |
| **statuts message (ascii):** | signal not acquired\n |
| **(when present)** | timed out waiting for TraceMutex\n |
| | timed out waiting for data\n |
| **Query Response:** | :CONStellation:TRACe:FETCh? |

1,1,288,-1871.37,0.00,629.98,0.00,-1796.91,0.00,-619.88,0.00,-574.94,0.00,
-631.87,0.00,-582.26,0.00,586.35,0.00,-1805.57,0.00,-1796.19,0.00,-1803.18,
0.00,-605.25,0.00,-600.47,0.00,599.68,0.00,584.98,0.00,-1794.42,0.00,
-603.39,0.00,-610.97,0.00,-1793.05,0.00,585.14,0.00,-1790.75,0.00,612.04,
0.00,1793.31,0.00,607.42,0.00,1806.40,0.00,1788.95,0.00,-598.09,0.00,
607.93,0.00,592.68,0.00,-590.26,0.00,611.98,0.00,586.29,0.00,617.14,0.00,
593.83,0.00,-598.98,0.00,-605.47,0.00,-1783.44,0.00,585.87,0.00,-1800.64
,0.00,-594.62,0.00,-603.46,0.00,-596.39,0.00,-597.52,0.00,593.43,0.00,
-1803.41,0.00,-1798.85,0.00,-1798.32,0.00,-607.28,0.00,-593.63,0.00,601.10,
0.00,595.16,0.00,-1795.80,0.00,-601.23,.....

| NOTE | Returned data includes Sync, Pilot and Data values. |
|---|---|
| | Constellation Trace must be enabled to return valid data. |

## 6.3      DISTRIBUTION GRAPH

### 6.3.1      Distribution - Persistence

**:DISTribution:PERSistence**
**:DISTribution:PERSistence?**

|  |  |
|---|---|
| **Description:** | Set command sets Persistence on Distribution graph. |
|  | Query command returns parameter setting. |
| **Range:** | 1 to 10 |
| **Default Value:** | 1 |
| **Set/Query Format:** | NR1 |
| **Example:** | :DISTribution:PERSistence 5 |
|  | Sets Distribution Graph Persistence to 5. |
| **Query Response:** | :DISTribution:PERSistence? |
|  | 5 |

### 6.3.2      Distribution - Trace Enable

**:DISTribution:TRACe:ENABle**
**:DISTribution:TRACe:ENABle?**

|  |  |
|---|---|
| **Description:** | Set command Enables/Disables Distribution trace. |
|  | Query command returns parameter setting. |
| **Parameter:** | OFF \| ON \| 0 \| 1 |
| **Default Value:** | OFF |
| **Set/Query Format:** | Boolean |
| **Example:** | :DISTribution:TRACe:ENABle ON |
|  | Enables Distribution trace. |
| **Query Response:** | :DISTribution:TRACe:ENABle? |
|  | 1 |

| NOTE | Trace must be enabled (ON) to return valid data. |
|---|---|

### 6.3.3 Distribution - Trace Data Query

## :DISTribution:TRACe:FETCh?

| | |
|---|---|
| **Description:** | Command returns Distribution trace data. |
| **Query Data:** | <statusbyte>,<#pairs>,<x data>,<y data>,<status message> |
| **statusbyte (NR1):** | 0 = Invalid |
| | 1 = Valid |
| | 2 = Inaccurate |
| **#pairs (NR1):** | Number of x,y coordinate pairs to follow |
| **x, y data (NR2):** | coordinate value |
| **statuts message (ascii):** | signal not acquired\n |
| **(when present)** | timed out waiting for TraceMutex\n |
| | timed out waiting for data\n |
| **Query Response:** | :DISTribution:TRACe:FETCh? |

1,1,288,-1871.37,0.00,629.98,0.00,-1796.91,0.00,-619.88,0.00,-574.94,0.00,-631.87,0.00,-582.26,0.00,586.35,0.00,-1805.57,0.00,-1796.19,0.00,-1803.18, 0.00,-605.25,0.00,-600.47,0.00,599.68,0.00,584.98,0.00,-1794.42,0.00, -603.39,0.00,-610.97,0.00,-1793.05,0.00,585.14,0.00,-1790.75,0.00,612.04, 0.00,1793.31,0.00,607.42,0.00,1806.40,0.00,1788.95,0.00,-598.09,0.00, 607.93,0.00,592.68,0.00,-590.26,0.00,611.98,0.00,586.29,0.00,617.14,0.00, 593.83,0.00,-598.98,0.00,-605.47,0.00,-1783.44,0.00,585.87,0.00,-1800.64 ,0.00,-594.62,0.00,-603.46,0.00,-596.39,0.00,-597.52,0.00,593.43,0.00, -1803.41,0.00,-1798.85,0.00,-1798.32,0.00,-607.28,0.00,-593.63,0.00,601.10, 0.00,595.16,0.00,-1795.80,0.00,-601.23,.....

| NOTE | Returned data includes Sync, Pilot and Data values. |
|---|---|
| | Distribution Trace must be enabled to return valid data. |

## 6.4 POWER OVER TIME

### 6.4.1 Power Over Time - Marker Enable

**:PTIME:TRACe:MARKn:ENABle**
**:PTIME:TRACe:MARKn:ENABle?**

| | |
|---|---|
| **Description:** | Set command Enables/Disables Marker for Power Over Time graph. |
| | Query command returns parameter setting. |
| **Parameter:** | OFF \| ON \| 0 \| 1 |
| **Default Value:** | OFF |
| **Set/Query Format:** | Boolean |
| **Example:** | :PTIME:TRACe:MARK2:ENABle ON |
| | Enables Marker 2 for Power Over Time graph. |
| **Query Response:** | :PTIME:TRACe:MARK2:ENABle? |
| | 1 |

> **NOTE** MARKn = 1 or 2 (Marker 1 or 2)

### 6.4.2 Power Over Time - Marker Position

**:PTIME:TRACe:MARKn:XPOS**
**:PTIME:TRACe:MARKn:XPOS?**

| | |
|---|---|
| **Description:** | Set command defines Marker position on Power Over Time graph. |
| | Query command returns parameter setting. |
| **Range:** | 0 to Span |
| **Units:** | ms |
| **Default Value:** | 0.0 ms |
| **Set/Query Format:** | NRf \| NR2 |
| **Example:** | :PTIME:TRACe:MARK2:XPOS 100ms |
| | Positions Marker 2 at 100 ms on Power Over Time graph. |
| **Query Response:** | :PTIME:TRACe:MARK2:XPOS? |
| | 100 |

> **NOTE** MARKn = 1 or 2 (Marker 1 or 2)

### 6.4.3 Power Over Time - Marker Y Value Query

**:PTIME:TRACe:MARKn:YVALue?**

| | |
|---|---|
| **Description:** | Command returns Power Over Time Y value for Marker. |
| **Query Data:** | <statusbyte>,<value> |
| **statusbyte (NR1):** | 0 = Invalid |
| | 1 = Valid |
| | 2 = Inaccurate |
| **value (NR2):** | dBm |
| **Query Response:** | :PTIME:TRACe:MARK2:YVALue? |
| | 1,10.45 |

> **NOTE** MARKn = 1 or 2 (Marker 1 or 2)
> Marker must be enabled to obtain valid data.

### 6.4.4 Power Over Time - Span

**:PTIME:SPAN**
**:PTIME:SPAN?**

| | |
|---|---|
| **Description:** | Set command sets Span of Power Over Time graph. |
| | Query command returns parameter setting. |
| **Range:** | 10 to 1800 seconds |
| **Units:** | seconds |
| **Default Value:** | 10 seconds |
| **Set/Query Format:** | NRf \| NR1 |
| **Example:** | :PTIME:SPAN 500s |
| | Sets Power Over Time graph Span to 500 seconds. |
| **Query Response:** | :PTIME:SPAN? |
| | 500 |

### 6.4.5 Power Over Time - Trace Enable

**:PTIME:TRACe:ENABle**
**:PTIME:TRACe:ENABle?**

| | |
|---|---|
| **Description:** | Set command Enables/Disables Power Over Time trace. |
| | Query command returns parameter setting. |
| **Parameter:** | OFF \| ON \| 0 \| 1 |
| **Default Value:** | OFF |
| **Set/Query Format:** | Boolean |
| **Example:** | :PTIME:TRACe:ENABle ON |
| | Enables Power Over Time trace. |
| **Query Response:** | :PTIME:TRACe:ENABle? |
| | 1 |

| NOTE | Trace must be enabled (ON) to return valid data. |
|---|---|

### 6.4.6 Power Over Time - Trace Data Query

**:PTIME:TRACe:LIVE?**

| | |
|---|---|
| **Description:** | Command returns Power Over Time trace data. |
| **Query Data:** | <statusbyte>,<#pairs>,<x data>,<y data>,<status message> |
| **statusbyte (NR1):** | 0 = Invalid |
| | 1 = Valid |
| | 2 = Inaccurate |
| **#pairs (NR1):** | Number of x,y coordinate pairs to follow |
| **x, y data (NR2):** | coordinate value |
| **statuts message (ascii):** | signal not acquired\n |
| **(when present)** | timed out waiting for TraceMutex\n |
| | timed out waiting for data\n |
| **Query Response:** | :PTIME:TRACe:LIVE? |
| | 1,2,0.00,10.45,330.00,10.45 |

| NOTE | Power Over TIme trace must be enabled to return valid data. |
|---|---|

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