MX887010A
Cellular Standards Sequence Measurement Operation Manual

Sixth Edition

- **For safety and warning information, please read this manual before attempting to use the equipment.**
- **Additional safety and warning information is provided in the MT8870A Universal Wireless Test Set Operation Manual. Please refer to this document before using the equipment.**
- **Keep this manual with the equipment.**

ANRITSU CORPORATION

Document No.: M-W3607AE-6.0

Safety Symbols

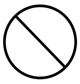
To prevent the risk of personal injury or loss related to equipment malfunction, Anritsu Corporation uses the following safety symbols to indicate safety-related information. Ensure that you clearly understand the meanings of the symbols BEFORE using the equipment. Some or all of the following symbols may be used on all Anritsu equipment. In addition, there may be other labels attached to products that are not shown in the diagrams in this manual.

Symbols used in manual

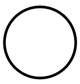
⚠ **DANGER**	This indicates a very dangerous procedure that could result in serious injury or death if not performed properly.
⚠ **WARNING**	This indicates a hazardous procedure that could result in serious injury or death if not performed properly.
⚠ **CAUTION**	This indicates a hazardous procedure or danger that could result in light-to-severe injury, or loss related to equipment malfunction, if proper precautions are not taken.

Safety Symbols Used on Equipment and in Manual

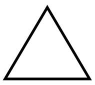
The following safety symbols are used inside or on the equipment near operation locations to provide information about safety items and operation precautions. Ensure that you clearly understand the meanings of the symbols and take the necessary precautions BEFORE using the equipment.



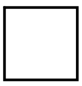
This indicates a prohibited operation. The prohibited operation is indicated symbolically in or near the barred circle.



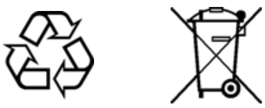
This indicates an obligatory safety precaution. The obligatory operation is indicated symbolically in or near the circle.



This indicates a warning or caution. The contents are indicated symbolically in or near the triangle.



This indicates a note. The contents are described in the box.



These indicate that the marked part should be recycled.

MX887010A
Cellular Standards Sequence Measurement
Operation Manual

20 August 2012 (First Edition)
20 January 2017 (Sixth Edition)

Equipment Certificate

Anritsu Corporation guarantees that this equipment was inspected at shipment and meets the published specifications.

Anritsu Warranty

- During the warranty period, Anritsu Corporation will repair or exchange this software free-of-charge if it proves defective when used as described in the operation manual.
- The warranty period is 6 months from the purchase date.
- The warranty period after repair or exchange will remain 6 months from the original purchase date, or 30 days from the date of repair or exchange, depending on whichever is longer.
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   - ii) If this Software is used in conjunction with other non-Anritsu-approved software.
   - iii) Recovery of lost or damaged data.
   - iv) If this Software or the Equipment has been modified, repaired, or otherwise altered without Anritsu's prior approval.
   - v) For any other reasons out of Anritsu's direct control and responsibility, such as but not limited to, natural disasters, software virus infections, etc.

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Cautions against computer virus infection

- Copying files and data
  Only files that have been provided directly from Anritsu or generated using Anritsu equipment should be copied to the instrument.
  All other required files should be transferred by means of USB or CompactFlash media after undergoing a thorough virus check.
- Adding software
  Do not download or install software that has not been specifically recommended or licensed by Anritsu.
- Network connections
  Ensure that the network has sufficient anti-virus security protection in place.

CE Conformity Marking

Anritsu affixes the CE conformity marking on the following product(s) in accordance with the Decision 768/2008/EC to indicate that they conform to the EMC and LVD directive of the European Union (EU).

CE marking

1. Product Model

Software: MX887010A Cellular Standards Sequence Measurement

2. Applied Directive and Standards

When MX887010A Cellular Standards Sequence X Measurement is installed in the MT8870A, the applied directive and standards of this software conform to those of the MT8870A main frame.

PS: About main frame

Please contact Anritsu for the latest information on the main frame types that MX887010A can be used with.

RCM Conformity Marking

Anritsu affixes the RCM mark on the following product(s) in accordance with the regulation to indicate that they conform to the EMC framework of Australia/New Zealand.

RCM marking

1. Product Model

Software: MX887010A Cellular Standards Sequence Measurement

2. Applied Directive and Standards

When MX887010A Cellular Standards Sequence Measurement is installed in the MT8870A, the applied directive and standards of this software is conform to those of the MT8870A main frame.

PS: About main frame
Please contact Anritsu for the latest information on the main frame types that MX887010A can be used with.

About This Manual

This manual mainly describes the operation of the MX887010A Cellular Standards Sequence Measurement.

Products related to the MT8870A Universal Wireless Test Set include:

- MT8870A Universal Wireless Test Set (main unit)
- Modules installed in MT8870A Universal Wireless Test Set
- Application software installed in modules
- Control software installed in external PC controller

These products are called the Universal Wireless Test Set Series. The operation manuals for the Universal Wireless Test Set Series consist of separate documents for the main unit, module(s), application software, and control software as listed below. indicates this manual.

- **Main Unit Operation Manual**

  Describes precautions for safe use, how to connect power and interfaces, and operation and maintenance.

- **Module Operation Manual**

  Describes specifications and operation of modules.
  Each module has its own operation manual.

- **Application Software Operation Manual**

  Describes how to use application software installed in modules and remote commands.
  Each application software has its own operation manual.

  - **MX887010A Cellular Standards Sequence Measurement Operation Manual**

- **Control Software Operation Manual**

  Describes how to install and operate software for controlling MT8870A via PC.
  Each control software has its own operation manual.

Table of Contents

Chapter 1 Outline

This chapter outlines the functions of the MX887010A Cellular Standards Sequence Measurement, product configuration, and license registration.

1.1 MX887010A Outline

The MX887010A Cellular Standards Sequence Measurement (hereafter MX887010A) is licensed software for the MU887000A TRX Test module.

The MX887010A has the following functions:

Spectrum Monitor

The spectrum of signals received by the MU887000A is measured. The resolution, span, averaging, and peak hold can be set, like using a general spectrum analyzer.

Multiple Power Measurement

The power of signals received by the MU887000A is measured at fixed time intervals.
If the power of signals output by the DUT is changed at a fixed time interval, multiple power levels can be measured over a short time period.

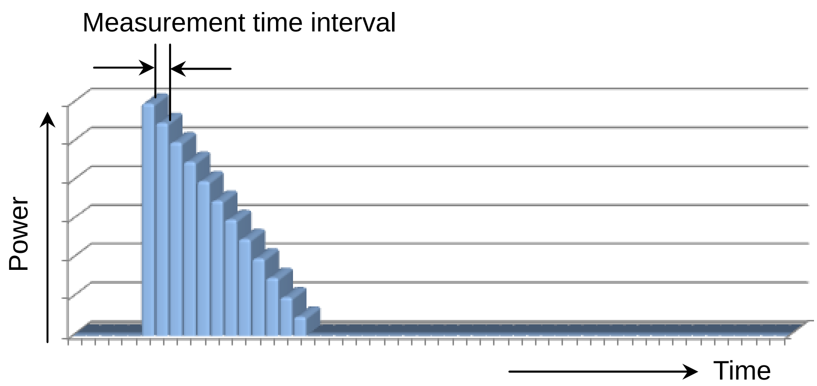


Figure 1.1-1 Multiple Power Measurement Target Signal

Transmission/Reception versus Frequency Measurement (Tx/Rx vs. Frequency)

The power of signals received at a fixed time interval is measured as with multiple power measurement. Unlike the multiple power measurement, the measured frequency can be changed for each measurement cycle.

Signals can be sent from the MU887000A during measurement.

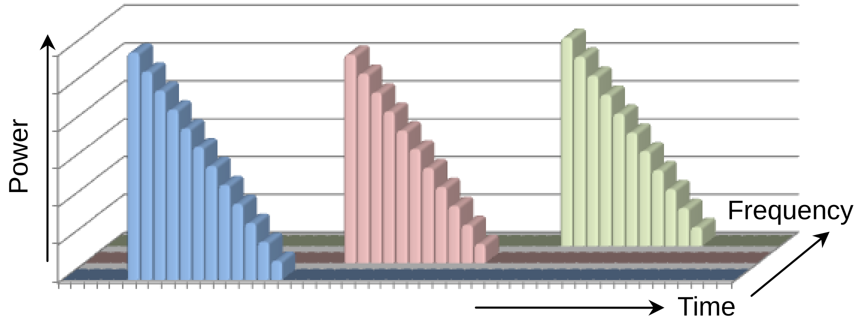


Figure 1.1-2 Tx/Rx vs. Frequency Measurement Target Signal

Narrowband Power versus Time Measurement (Narrowband vs. Time)

The power of signals received at a fixed time interval is measured, as with multiple power measurement. However, the power is measured after passing the signals through a narrow bandpass filter, so only the power of the target frequency is measured even when there are other frequencies.

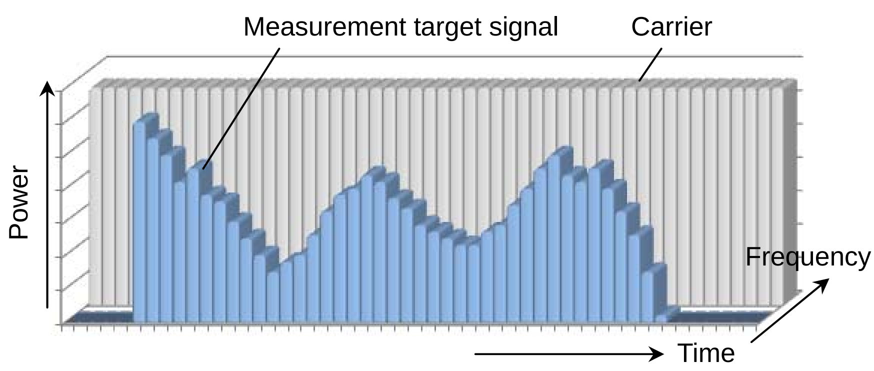


Figure 1.1-3 Narrowband Power vs. Time Measurement Target Signal

IQ Capture

IQ data of signals received by the MU887000A is captured and saved to the memory.
IQ data can be captured while limiting the bandwidth of the baseband signals.

Sequence Measurement

The power of received signals is measured according to the sequence table with multiple measurement items.
When fixed test items are described in the sequence table, the test can be automated by sequence measurement.
This manual describes the following measurement items; for details, refer to Chapter 3 “Sequence Measurement”.

Transmission power: The power of received signals is measured at a fixed time interval in the same way as the Tx/Rx vs Frequency measurement. The output level of the MU887000A can be changed at a fixed time interval as well.

1.2 Product Configuration

This section introduces the standard MT887010A configuration as well as options and application parts.

1.2.1 Standard configuration

The standard MX887010A configuration is listed in the following table.

Table 1.2.1-1 Standard Configuration

Items	Model/Symbol	Product name	Qty	Items
Main Object		Storage media (DVD, etc.)	1	
	MX887010A	Cellular Standards Sequence Measurement		On storage media (DVD, etc.)
	W3607AE	MX887010A Cellular Standards Sequence Measurement Operation Manual		English, on storage media (DVD, etc.)

1.2.2 Application software

The MX887010A tests sequence measurement items using optional application software and modulation signal waveform files are listed below. These options are sold separately. To order, specify the model/code and name.

Table 1.2.2-1 Application Software

Model/Code	Name
MX887011A	W-CDMA/HSPA Uplink TX Measurements
MX887012A	GSM/EDGE Uplink TX Measurements
MX887013A	LTE FDD Uplink TX Measurements
MX887014A	LTE TDD Uplink TX Measurements
MX887015A	CDMA2000 Reverse Link TX Measurements
MX887016A	1xEV-DO Reverse Link TX Measurements
MX887017A	TD-SCDMA Uplink TX Measurements

Table 1.2.2-2 Waveforms

Model/Code	Name
MV887011A	W-CDMA/HSPA Downlink Waveforms
MV887012A	GSM/EDGE Downlink Waveforms
MV887013A	LTE FDD Downlink Waveforms
MV887014A	LTE TDD Downlink Waveforms
MV887015A	CDMA2000 Forward Link Waveforms
MV887016A	1xEV-DO Forward Link Waveforms
MV887017A	TD-SCDMA Downlink Waveforms

1.2.3 Application parts

Some application parts (accessories) may be required. They can be ordered separately by specifying the model/code, name and quantity.

Table 1.2.3-1 Application Parts

Model/Code	Name	Remarks
W3607AE	MX887010A Cellular Standards Sequence Measurement Operation Manual	English, storage media (DVD, etc.)

1.3 License Registration

A license is required to use the MX887010A in the MU887000A. Refer to Chapter 8 “Utility Tool” in the *MU887000A TRX Test Module Operation Manual* for a description of how to perform license registration.

Chapter 2 Fundamental Measurements

This chapter describes the basic operation and fundamental measurements of the MX887010A.

2.1 Common Operations

This section describes operations that are common to the measurements in Chapter 3 “Sequence Measurement”.
Both Native and SCPI commands are described in the introduction to commands.

2.1.1 Selecting application

Switch the MU887000A application software to the MX887010A by setting the parameter to CELLULAR using the following command.

```
SYSSEL
:INSTrument[:SELect]
```

Switch the MX887010A measurement standards using the following command.
When a function described in this chapter is to be used, set the parameter to COMMON.
When a function described in Chapter 3 “Sequence Measurement” is to be used, set the parameter to SEQUENCE.

```
STDSEL
:CONFigure:CELLular:MEASurement:STANdard
```

When functions described in Section 2.2 “Spectrum Monitor” through Section 2.6 “IQ Capture” are to be used, select the measurement items using the following command.

```
MEASSEL
:CONFigure:CELLular:MEASurement:SELect
```

Measurement item	Parameter
Spectrum Monitor	SPMON
Multiple Power	MULTIPWR
TRx vs Frequency	TRXFREQ
Narrowband Power vs Time	NBANDPVT
IQ Capture	IQCAP

2.1.2 Setting ports

Set the MU887000A ports to be used. The following command sets both the port for outputting the downlink signal and the port for receiving the uplink signals.
Set Port1 to Port4 at the parameter

```
PORT
:ROUTe:PORT:CONNect:DIRection
```

When setting the sequence table in sequence measurement, the sequence commands set only the output port to Port 1 to Port 4.
The above-mentioned command sets the receiving port.

2.1.3 Frequency and level

Frequency

Set the frequency and channel of the measured signal using the following commands.
The signal sent from the MU887000A to the mobile station is the downlink signal and the signal sent from the mobile station to the MU887000A is the uplink signal.

- Uplink frequency (mobile station Tx frequency)
  `ULFREQ`
  `TXFREQ`
  `:CONFigure:CELLular:MEASurement:RFSettings:FREQuency`
- Downlink frequency (mobile station Rx frequency)
  `DLFREQ`
  `RXFREQ`
  `:CONFigure:CELLular:GENerator:RFSettings:FREQuency`

Level

Set the level of the signal sent (Tx) from and received (Rx) by the MU887000A using the following commands, respectively.

- Output level (Tx)
  `OLVL`
  `:CONFigure:CELLular:GENerator:RFSettings:LEVel`
- Input level (Rx)
  `ILVL`
  `:CONFigure:CELLular:MEASurement:RFSettings:LEVel`

Cable loss correction

The loss of coaxial cables can be corrected for the output, input, and measured levels.

Refer to Chapter 3 “Fundamental Operation” in the *MU887000A TRX Test Module Operation Manual* for an explanation of the commands and loss correction data.

2.1.4 Setting transmission signal

To transmit the waveform pattern from MU887000A by using the Cellular application software, load the waveform file into the waveform memory, and then follow the procedure below:

1. Select the waveform file in the waveform memory.
2. Select the waveform pattern in the waveform file selected in step 1.
3. Set the Modulation On/Off and Output On/Off.

Use the following commands to select waveform file and waveform pattern and to set modulation and output On and Off.

- Output On/Off
  `LVL`
  `:CONFigure:CELLular:GENerator:RFSettings:STATe`
- Modulation On/Off
  `MOD`
  `:CONFigure:CELLular:GENerator:BBMode`
- Waveform File Select
  `PACKAGE`
  `:CONFigure:CELLular:GENerator:ARB:PACKage:SELect`
- Waveform Pattern Select
  `DLPAT`
  `:CONFigure:CELLular:GENerator:ARB:WAVeform:PATTern:SELect`
  `DLPAT_SYNC`
  `:CONFigure:CELLular:GENerator:ARB:WAVeform:PATTern:SELect:SYNC`

Use the following commands to load the waveform file into the waveform memory.

Refer to Chapter 5, “SCPI Command Reference” in the MU887000A “TRX Test Module Operation Manual” for detail descriptions of the commands.

- To load the waveform file into the waveform memory
  `:SOURce:GPRF:GENerator:ARB:FILE:LOAD`
- To query the file name in the waveform memory
  `:SOURce:GPRF:GENerator:ARB:WAVeform:NAME`
- To optimize the waveform memory capacity
  `:SOURce:GPRF:GENerator:ARB:WAVeform:DEFRag`
- To delete the waveform file in the waveform memory
  `:SOURce:GPRF:GENerator:ARB:WAVeform:DELete`
- To query the waveform memory free space
  `:SOURce:GPRF:GENerator:ARB:WAVeform:FREE`

2.1.5 Waveform patterns

The MX887010A can modulate transmission signals. Specify a pattern from the waveform file (sold separately) for the modulation signal. Multiple pattern data are saved in one file.

Refer to Chapter 3, “Waveform File Details” in the *Waveform Files for Cellular Application Operation Manual* for details of the waveform files.

2.1.6 Starting/stopping measurement

Starting measurement

To start measurement, send the following command.
The status indication lamp 3 of MU887000A is on during the execution of measurement or analysis. Refer to Appendix D "Status indication of lamps" in the *MU887000A TRX Test Module Operation Manual* for an explanation of the lamp.

```
SNGLS
:INITiate:CELLular:MEASurement:SINGle
```

Stopping measurement

To stop measurement, send the following command.

```
MEASSTOP
:ABORt:CELLular:MEASurement
```

Checking measurement status

To query the measurement status and errors, send the following command.

```
MSTAT
:FETCh:CELLular:MEASurement:STATe
```

Table 2.1.6-1 Query Responses

Response	Meaning
0	Measurement completed normally
2	Level over
9	Measurement is in progress or not executed
12	Timeout of Tx measurement

The measurement status and errors can be queried using the status registers.
Refer to Chapter 3 "Fundamental Operation" in the *MU887000A TRX Test Module Operation Manual* for an explanation of the status registers.
The allocations of MX887010A status registers are described in the following tables.

Native Command Mode

Table 2.1.6-2 Bit Definitions of End Event Status Register (Signal Generator)

Bit	Description
7 to 1	Not used and always set to 0
0	Changed to 1 at end of reading waveform file

Table 2.1.6-3 Bit Definitions of Error Event Status Register (Signal Generator)

Bit	Description
7 to 1	Not used and always set to 0
0	Changed to 1 at error in read waveform file

Table 2.1.6-4 Bit Definitions of End Event Status Register (Measurement)

Bit	Description
7 to 2	Not used and always set to 0
1	Changed to 1 after trigger prepared
0	Changed to 1 when measurement preparation completed

Table 2.1.6-5 Bit Definitions of Error Event Status Register (Measurement)

Bit	Description
7 to 3	Not used and always set to 0
2	Changed to 1 at measurement timeout
1	Changed to 1 when measurement result under level
0	Changed to 1 when measurement result over level

SCPI Command Mode

Table 2.1.6-6 Bit Definitions of Signal Generator Status Register

Bit	Description
15 to 1	Not used and always set to 0
0	Changed to 1 while reading file

Table 2.1.6-7 Bit Definitions of Measurement Status Register

Bit	Description
15 to 2	Not used and always set to 0
1	Changed to 1 while preparing trigger
0	Changed to 1 during measurement

Table 2.1.6-8 Bit Definitions of Signal Generator Questionable Register

Bit	Description
15 to 1	Not used and always set to 0
0	Changed to 1 at error in read file

Table 2.1.6-9 Bit Definitions of Measurement Questionable Register

Bit	Description
15 to 3	Not used and always set to 0
2	Changed to 1 at measurement timeout
1	Changed to 1 when measurement result under level
0	Changed to 1 when measurement result over level

2.2 Spectrum Monitor

The spectrum monitor function measures the spectrum of received signals.

2.2.1 Setting measurement conditions

The following spectrum monitor items are set in the same way as setting a general spectrum analyzer.

Frequency and input level
Frequency and input level are measured using the center of the measured frequency range and the input level.

Span
Span is the difference between the upper and lower limits of the measured frequency range.
Refer to Table 2.2.1-1 for the settings. Span settings are limited by the center frequency.

Resolution
Resolution is the ability to separate adjacent spectrums.
Finer spectrums can be measured using smaller resolution settings.
Refer to Table 2.2.1-1 for the settings.
Resolution settings are limited by the span, and the size of the spectrum data depends on the resolution and span settings.

Table 2.2.1-1 Span and Resolution Setting Range and Number of Data Points

Span	Resolution								
(MHz)	1 MHz	300 kHz	100 kHz	30 kHz	10 kHz	3 kHz	1 kHz	300 Hz	100 Hz
160*1	821	1641	6555	26217	–	–	–	–	–
100*1	513	1025	4097	16385	–	–	–	–	–
50*2	513	513	2049	8193	–	–	–	–	–
25	–	513	1025	2049	8193	–	–	–	–
10	–	–	513	1025	4097	16385	–	–	–
5	–	–	513	513	2049	8193	–	–	–
2.5	–	–	–	513	1025	4097	8193	–	–
1	–	–	–	–	513	1025	4097	16385	32739

*1: This can be set when the center frequency is 1900 MHz or more.

*2: This can be set when the center frequency is 500 MHz or more.

Detection mode
These are the modes for detect high-frequency signal amplitude.

Peak:	Amplitude peak (envelope curve)
RMS:	Amplitude root mean square

Analysis time
This is the time of spectrum analysis signals. Set 1 or 10 ms.

Saving method
Select the saved measurement result data from:

Off:	Latest measurement result
Average:	Average of total measurement values
Max Hold:	Maximum value from multiple measurement results
Max Hold:	Minimum value from multiple measurement results

Data acquisition count
When the selected save method is Average, Max Hold, or Max Hold, set the data acquisition count from 2 to 100 to calculate the average, maximum, and minimum.

Trigger
Select the trigger method from:

Free run:	Starts measurement at any time within MT8870A
Power:	Starts measurement when signal 30 dB lower level than specified input level

Trigger delay time
This is the time difference between triggering and starting spectrum measurement.
Set a time from –9.99 to 9.99 ms.

Trigger timeout time
This is maximum trigger wait time. If there is no trigger within this time, measurement is stopped and a trigger timeout error occurs. Set a time from 1 to 60 s.

Power measurement bandwidth
When the frequency range is specified, the spectrum of the range is integrated to measure power.

2.2.2 Measurement results

Refer to Section 2.1.6 “Starting/stopping measurement” for how to query spectrum monitor measurement start, stop, and status.

The measurement results are as follows:

- Spectrum data
- Number of measured data points
  This is the number of spectrum data points listed in Table 2.2.1-1.
- Power
  This is the power in the frequency band specified at the power measurement range.

2.2.3 Commands

The following commands are used to set and query spectrum monitor settings.

- Frequency and level
  Refer to "Uplink frequency" and "Input level" described in Section 2.1.3 "Frequency and level".
- Span
  `SPMSPAN`
  `:CONFigure:CELLular:COMMon:SPMonitor:SPAN`
- Resolution
  `SPMRBW`
  `:CONFigure:CELLular:COMMon:SPMonitor:RBW`
- Detection mode
  `SPMDETECT`
  `:CONFigure:CELLular:COMMon:SPMonitor:DETect`
- Measurement time
  `SPMTIME`
  `:CONFigure:CELLular:COMMon:SPMonitor:TIME`
- Save method
  `SPMSTORAGEMODE`
  `:CONFigure:CELLular:COMMon:SPMonitor:STORage:MODE`
- Capture count
  `SPMSTORAGECOUNT`
  `:CONFigure:CELLular:COMMon:SPMonitor:STORage:COUNt`
- Trigger
  `SPMTGSRC`
  `:TRIGger:CELLular:COMMon:SPMonitor:SOURce`
- Trigger delay time
  `SPMTGDELAY`
  `:TRIGger:CELLular:COMMon:SPMonitor:DELay`
- Trigger timeout
  `SPMTIMEOUT`
  `:TRIGger:CELLular:COMMon:SPMonitor:TOUT`
- Power measurement bandwidth
  `SPMPMBW`
  `:CONFigure:CELLular:COMMon:SPMonitor:PMBW`
- Spectrum data
  `WAVESPMON`
  `:FETCh:CELLular:COMMon:SPMonitor:TRACe:DATA`

- Number of measured data points
  SPMWAVEPOINT
  :FETCh:CELLular:COMMon:SPMonitor:TRACe:POINt
- Power
  SPMPWR
  :FETCh:CELLular:COMMon:SPMonitor:POWer

2.2.4 Example of spectrum monitor measurement

An example of spectrum monitor measurement using the Native command mode is described here.

The sample program on the following pages can be executed as a Tera Term macro. Refer to the Tera Term Help file for how to execute the macro.

Processing flow

1. Set the application software type to CELLULAR.
2. Set the measurement standard to the MX887010A fundamental measurement.
3. Set the measurement item to spectrum monitor.
4. Set the following measurement conditions:

Test port	Port 1
Input level	–10 dBm
Center frequency	1200 MHz
Span	10 MHz
Resolution	10 kHz
Detection mode	RMS
Save method	Average
Averaging count	20
Trigger	Free run
Measurement time	10 ms
Power measurement bandwidth	1 MHz

5. Initialize the status registers.
6. Start measurement.
7. Read the status registers.
8. After measurement is completed, query the following values:

   Power
   Number of data points
   Spectrum data

```
; Sample program for Spectrum Monitor
; Anritsu Corporation March,2012
; Macro for Tera Term Version 4.69
;
; set local echo to on
setecho 1
flushrecv
; time out 3 second
timeout=3

; Set language to "Native".
sendln 'SYST:LANG NAT'
call check_error_code

; Set application software type to "CELLULAR".
sendln 'SYSSEL CELLULAR'
call check_error_code

; Set standard to "Common".
sendln 'STDSEL COMMON'
call check_error_code

; Set measurement to "Spectrum Monitor".
sendln 'MEASSEL SPMON'
call check_error_code

; Set test port to "Port1".
sendln 'PORT PORT1,PORT1'
call check_error_code

; Set Input Range to "-10 dBm".
sendln 'ILVL -10'
call check_error_code

; Set center frequency to "1200 MHz".
sendln 'ULFREQ 1200MHZ'
call check_error_code

; Set resolution to "10 kHz".
sendln 'SPMRBW 10KHZ'
call check_error_code

; Set detection mode to "RMS".
sendln 'SPMDETECT RMS'
```

```
call check_error_code

; Set storage mode to "Average".
sendln 'SPMSTORAGEMODE AVG'
call check_error_code

; Set averaging time to "20".
sendln 'SPMSTORAGECOUNT 20'
call check_error_code

; Set trigger to "Free run".
sendln 'SPMTGSRC FREERUN'
call check_error_code

; Set analyzing time to "10 ms".
sendln 'SPMTIME 10MS'
call check_error_code

; Set power measuring band width to "1 MHz".
sendln 'SPMPMBW 1MZ'
call check_error_code

; Clear event registers.
sendln '*CLS'
call check_error_code

; Start measurement
sendln 'SNGLS'
call check_error_code

; query event status register
  sendln 'ESR2?'
  waitln '0' '1'
call check_error_code

; waiting measurement up to 10 second
for i 1 10

  sendln 'ESR2?'
  pause 1; wait 1 second
  recvln
  recvln
  ;call check_response ; debug
  if result=0 goto _timeout
```

```
  if result=1 then
          break
  endif
  call check_error_code
next

; Query total power in specified bandwidth
sendln 'SPMPWR?'
call check_error_code

; Query number of spectrum data points
sendln 'SPMWAVEPOINT?'
call check_error_code

; Query spectrum data
sendln 'WAVESPMON? 2,0,4096'
call check_error_code

messagebox  'Macro end successfully' 'Finish'

End

;       ------------ subroutines -----------

:check_error_code
  ; query error
  sendln 'SYSERR?'
  waitln 'No error'

  ; in case of timeout
  if result=0 goto _timeout
  ; in case of error occurring
  if result=2 then
          e_message='Error code = '
          strconcat e_message inputstr
          messagebox  e_message 'Command Error occurred'
          end
  endif

  ; in case of no error

return

:check_response
```

```
  ;for debug
  messagebox inputstr 'debug1'
  int2str result_str result
  messagebox result_str 'debug2'

  return

:_timeout
  messagebox  'No response from MT8870A.' 'Time out!'
  call check_error_code
  End
```

2.3 Multiple Power Measurement

The multiple power measurement function measures average power at a fixed time interval called a “step”. The total of measurement count is called the “step count”.
Multiple power measurement measures multiple output levels of mobile stations for a short time, assuming that the mobile stations can output signals with stepped level changes.

To execute the multiple power measurement, the target signal requires:

- A trigger to detect the measurement start
- A step part where the level changes stepwise

Refer to Section 2.3.1 “Setting measurement conditions” for the trigger detection conditions.

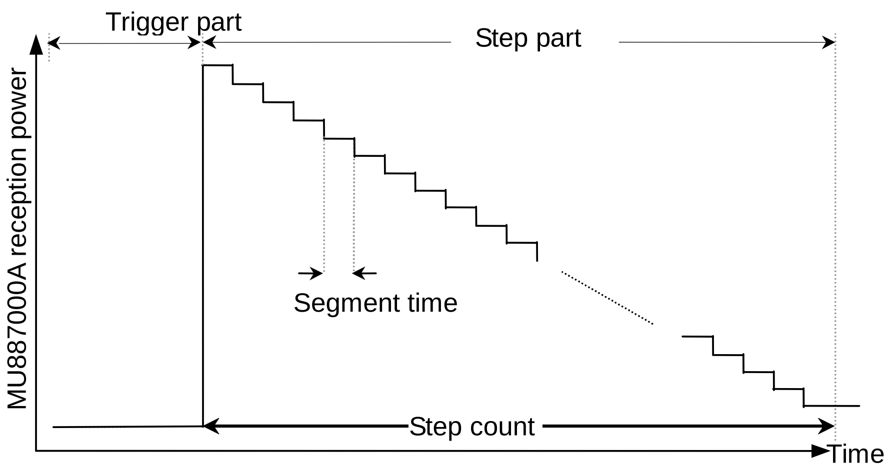


Figure 2.3-1 Example of Multiple Power Measurement Signal

2.3.1 Setting measurement conditions

The multiple power measurement settings are:

Frequency
Set the frequency of RF signals input to the MU887000A.

Input level
Set the level of RF signals input to the MU887000A. The input levels can be changed during multiple power measurement. Refer to Section 2.3.3 "Setting input level".

Step count
Set the step count from 10 to 100.

Step time width
Set the step time width from the following values:
0.5, 1, 2, 4, 5, 10, 20, 30, 40, 50, 60, 70, 80 ms

Filter
Set the filter to remove amplitude noise in RF signals.
Set the filter bandwidth from the following values:
1.2288 (CDMA2K), 1.4, 3, 3.84 (RRC), 5, 10, 15, 20 MHz

Measurement window
Set the measurement window and offset with a proportional ratio (%) to the step time.
The setting range is 0% to 75% of the offset, and 1% to 90% of the measurement window.
Set the offset and the measurement interval so that the total is less than or equal to 100%.

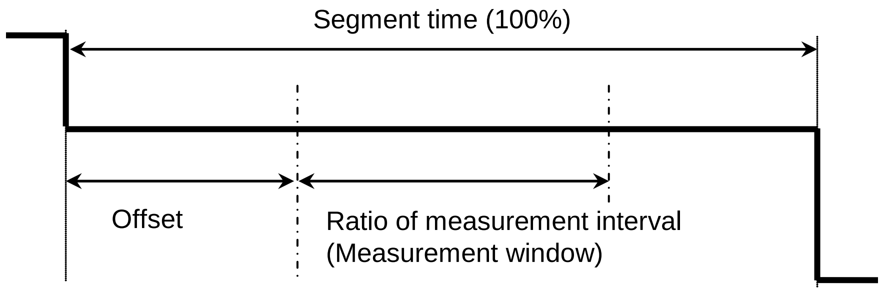


Figure 2.3.1-1 Measurement Window

Trigger level
The trigger level starts multiple power measurement; set a level difference from the input level in the range of –40.0 to 0 dB.

Trigger timeout time
This is the maximum trigger wait time. If a trigger does not occur within this time, measurement is stopped as a trigger timeout error. Set a time from 1 to 30 s.

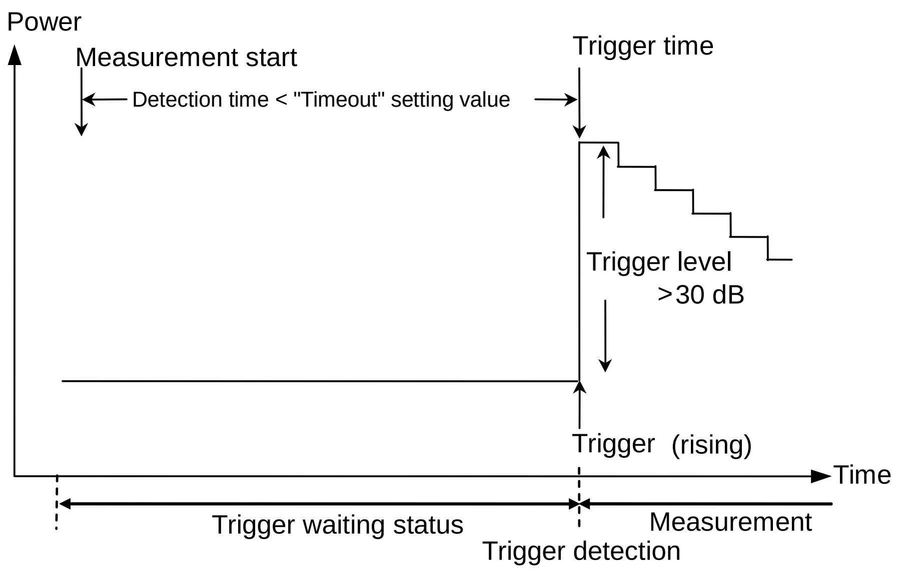


Figure 2.3.1-2 Trigger Detection Conditions

How to output invalid measurement results
Changing the input level during multiple power measurement disables the power measurement at that step. For this case, set whether to output an invalid value (999.99) or the actually measured value as the measurement result.

2.3.2 Measurement results

Refer to Section 2.1.6 "Starting/stopping measurement" for how to start and stop multiple power measurement, and query the status.

The multiple power measurement result is the level measured at each step.

Query the multiple power measurement result using the following remote command:

```
MRFPWR
:FETCh:CELLular:COMMon:MULTipower:MRFPower
```

To set the read range, specify the read start step number and read step count parameters.
The response l (1), l (2), l (3),….l (n) is the average power (dBm) at each step.

2.3.3 Setting input level

The RF signal level changes with time at multiple power measurement. During multi power measurement, the input level can be changed at the top of any step to optimize the input level for the RF signal level.

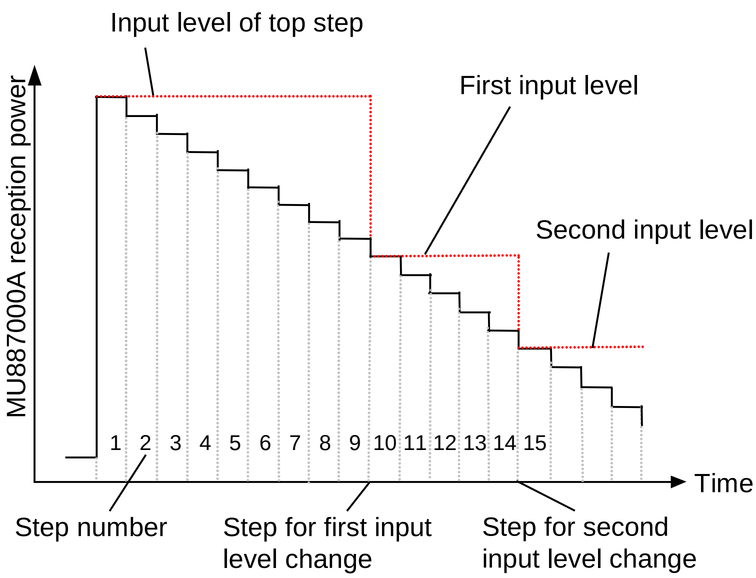


Figure 2.3.3-1 Input Level Setting Example

Use the following command to set the input level.

```
MPMEAS_TXREF
:CONFigure:CELLular:COMMon:MULTipower:TXRef
```

Set input level control On/Off at the first parameter.
When the first parameter is Off, the input level is the value set at the input level as described in Section 2.1.3 "Frequency and level".
When the first parameter is On, set the first level, level change step, and level after the change at the second and subsequent parameters.

If the input level is not to be changed during multiple power measurement, set:
`MPMEAS_TXREF OFF`

Use the following command to change input level to 0, –10, and –15 dBm at steps 10 and 15 as in Figure 2.3.3-1:
`MPMEAS_TXREF ON,0,10,-10,15,-15`

Attenuator switching requires 500 μs to change the input level. A result measured during this 500 μs is inaccurate, so the invalid value (999.99) can be displayed for such results by using the following command:

```
MPMEAS_INV_RSLT_OUT
:CONFigure:CELLular:COMMon:MULTipower:IROutput
```


2.3.4 Commands

The following commands can be used to set and query multiple power measurement:

- Frequency
  `ULFREQ`
  `:CONFigure:CELLular:MEASurement:RFSettings:FREQuency`
- Input level
  `MPMEAS_TXREF`
  `:CONFigure:CELLular:COMMon:MULTipower:TXRef`
- Step count
  `MPMEAS_NUMSTEP`
  `:CONFigure:CELLular:COMMon:MULTipower:STEP:NUM`
- Step time width
  `MPMEAS_STEPTIME`
  `:CONFigure:CELLular:COMMon:MULTipower:STEP:TIME`
- Measurement interval and offset
  `MPMEAS_MW`
  `:CONFigure:CELLular:COMMon:MULTipower:PERiod`
- Filter
  `MPMEAS_FLT`
  `:CONFigure:CELLular:COMMon:MULTipower:FILTer`
- Trigger level
  `MPMEAS_TRG_LVL`
  `:TRIGger:CELLular:COMMon:MULTipower:THReshold`
- Trigger timeout time
  `MPMEAS_TIMEOUT`
  `:TRIGger:CELLular:COMMon:MULTipower:TOUT`
- How to output invalid measurement results
  `MPMEAS_INV_RSLT_OUT`
  `:CONFigure:CELLular:COMMon:MULTipower:IROutput`
- Power measurement result
  `MRFPWR`
  `:FETCh:CELLular:COMMon:MULTipower:MRFPower`

2.3.5 Example of Multiple power measurement

An example of multiple power measurement using the SCPI command mode is described here.

The sample program on the following pages can be executed as a Tera Term macro. Refer to the Tera Term Help file for how to execute the macro.

Processing flow

1. Set the application software type to CELLULAR.
2. Set the measurement standard to the MX887010A fundamental measurement.
3. Set the measurement item to multiple power.
4. Set the following measurement conditions:

Test port	Port 2
Frequency	2100 MHz
Input level	Switched Initial level 20 dBm 0 dBm at Step 20 –20 dBm at Step 40
Step count	50
Step time	10 ms
Trigger timeout	15 s
Offset	10%
Measurement window	80%
Filter	3.84 MHz

5. Initialize the status registers.
6. Start measurement.
7. Read the status registers.
8. After measurement is completed, query the power measurement results.

```
; Sample program for Multipower
; Anritsu Corporation March,2012
; Macro for Tera Term Version 4.69
;
; set local echo to on
setecho 1
flushrecv
; time out 10 second
timeout=10

; Set language to "SCPI".
sendln 'SYST:LANG SCPI'
call check_error_code

; Set application software type to "Cellular".
sendln ':INST CELLULAR'
call check_error_code

; Set standard to "Common".
sendln ':CONF:CELL:MEAS:STAN COMMON'
call check_error_code

; Set measurement to "Multi Power".
sendln ':CONF:CELL:MEAS:SEL MULTIPWR'
call check_error_code

; Set test port to "Port2".
sendln ':ROUT:PORT:CONN:DIR PORT2,PORT2'
call check_error_code

; Set frequency to "2100 MHz".
sendln ':CONF:CELL:MEAS:RFS:FREQ 2100MHZ'
call check_error_code

; Set Input Level to "20,0,-20 dBm".
sendln ':CONF:CELL:COMM:MULT:TXR ON,20,20,0,40,-20'
call check_error_code

; Set Number of Step to "50".
sendln ':CONF:CELL:COMM:MULT:STEP:NUM 50'
call check_error_code

; Set Power Step Time to "10 ms".
sendln ':TRIG:CELL:COMM:MULT:STEP:TIME 10'
```

```
call check_error_code

; Set Trigger Time out to "15 s".
sendln ':CONF:CELL:COMM:MULT:TOUT 15'
call check_error_code

; Set offset to "10%",duration to "80%".
sendln ':CONF:CELL:COMM:MULT:PER 10,80'
call check_error_code

; Set filter to "RRC (3.84 MHz)".
sendln ':CONF:CELL:COMM:MULT:FILT RRC'
call check_error_code

; Set Invalid result output to "Numeric data".
sendln ':CONF:CELL:COMM:MULT:IRO OFF'
call check_error_code

; Preset status registers.
sendln '*CLS'
sendln ':STAT:PRESET'
call check_error_code

; ! Note !
; Output the RF power of Device under test.

; Start measurement
sendln ':INIT:CELL:MEAS:SING'
call check_error_code

; waiting measurement up to 10 second
for i 1 10

  sendln ':STAT:OPER:MEAS?'
  pause 1; wait 1 second
  recvln
  recvln
  ;call check_response ; debug
  if result=0 goto _timeout
  if result=1 then
         break
  endif
  call check_error_code
next
```

```
; Query Multi Power Measurement level data
sendln ':FETC:CELL:COMM:MULT:MRFP? 1,50'
call check_error_code

messagebox  'Macro end successfully' 'Finish'

End

;       ------------ subroutines -----------

:check_error_code
  ; query error
  sendln ':SYSTem:ERRor?'
  waitln 'No error'

  ; in case of timeout
  if result=0 goto _timeout
  ; in case of error occurring
  if result=2 then
         e_message='Error code = '
         strconcat e_message inputstr
         messagebox  e_message 'Command Error occurred'
         end
  endif

  ; in case of no error

return

:check_response

  ;for debug
  messagebox inputstr 'debug1'
  int2str result_str result
  messagebox result_str 'debug2'

  return

:_timeout
  messagebox  'No response from MT8870A.' 'Time out!'
  call check_error_code
  End
```

2.4 Tx/Rx vs Frequency Measurement

The Tx/Rx vs Frequency measurement function is used to adjust/check the Tx/Rx power of mobile stations.

At Tx/Rx vs Frequency measurement, signals with level changes are output at a fixed time interval (segment) from the mobile stations and MU887000A. The average power of each segment is measured at the MU887000A. Also, the MU887000A changes the downlink and uplink frequencies for each sequence of multiple segments. The frequency change is processed at the last segment of each sequence. The power in the segment with the frequency change does not to be measured.

Using the MX887010A, the segment and sequence can be set from 2 to 1600, and from 1 to 400, respectively.

Measurement of the Tx power of a mobile station using the Tx/Rx vs Frequency measurement function requires a trigger level so the MU887000A detects the top of the sequence (Figure 2.4-1).

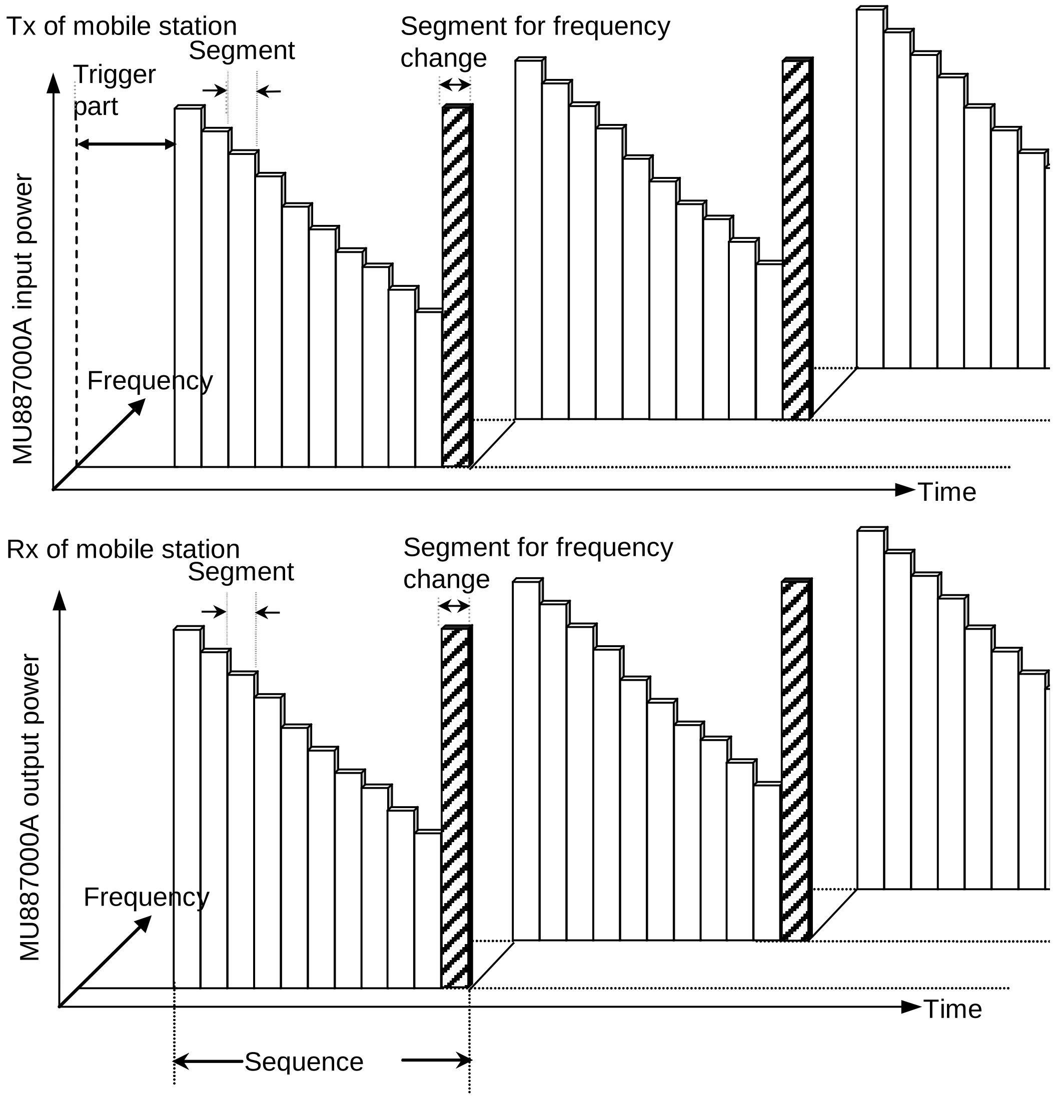


Figure 2.4-1 Tx/Rx vs Frequency Measurement Signal Example

2.4.1 Setting measurement conditions

The Tx/Rx vs Frequency measurement settings are:

Frequency
Set the output signal frequency and input signal frequency for sequences 0 to 399 in MHz before Tx/Rx vs Frequency measurement. The setting range is from 400 to 3800 MHz. A set frequency remains valid until it is reset.
For compatibility with previous products, there is a command to exit to set the frequency for sequence 10 to 19, 20 to 29, and 30 to 39.

Input level
At Tx/Rx vs Frequency measurement, the input level can be changed at any segment. The input level can be changed for up to 99 segments and this setting is common to sequences. Refer to Section 2.4.3 "Setting input level".

Output level
Set the RF signal output level for each segment before Tx/Rx vs Frequency measurement. The setting range is different for Test port1/2 and Test port3/4 of the MU887000A (Test port1/2: –130 to –10 dBm, Test port3/4: –120 to 0 dBm).
The output level can be set for up to 72 segments using the following command:

```
REGMRXPWR
:CONFigure:CELLular:COMMon:TRXFrequency:RXLevel
```

Note:

When setting the output level for each segment and the number of segments to be measured, also consider the level change time.

Filter
Set the filter to remove amplitude noise in RF signals.
Set the filter bandwidth from the following values:
1.2288 (CDMA2K), 1.4, 3, 3.84 (RRC), 5, 10, 15, 20 MHz

Sequence count
Set the sequence count (1 to 400).

Segment count
Set the segment count (2 to 1600) for one sequence. The segment count includes frequency change segments. Set the sequence count and segment count so that the product of the two is 6400 or less.

Segment duration

Select the segment time from the following:

Time specification	Set the time from 1 to 80 ms in 1-ms steps.
W-CDMA:	0.667 ms (10/15 ms)
CDMA2k	1.25 ms
LTE:	0.5 ms

Measurement window

Set the measurement window and offset with a proportional ratio (%) to the segment duration. Set the offset and the measurement interval so that the total is less than or equal to 100%.

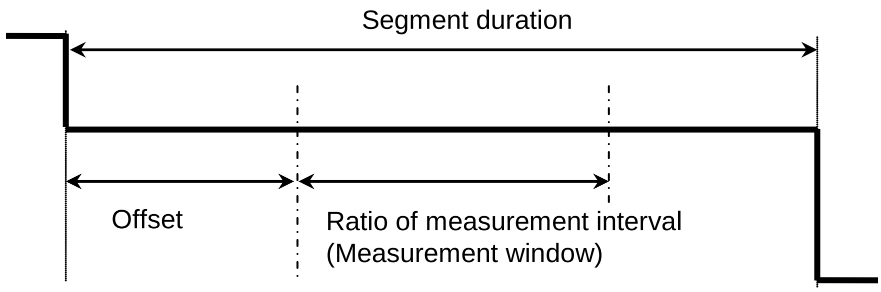


Figure 2.4.1-1 Measurement Window

Trigger level

Set the trigger level to start Tx/Rx vs Frequency measurement as the level difference from the input level in the range from –40.0 to 0 dB.

Trigger delay time

This is the delay time between triggering and starting the Tx/Rx vs. Frequency measurement.

Set it in the range of 0 to 1000.000 ms.

Trigger timeout

This is the maximum trigger wait time. If there is no trigger within this time, measurement stops and a trigger timeout error occurs. Set a time from 1 to 30 s.

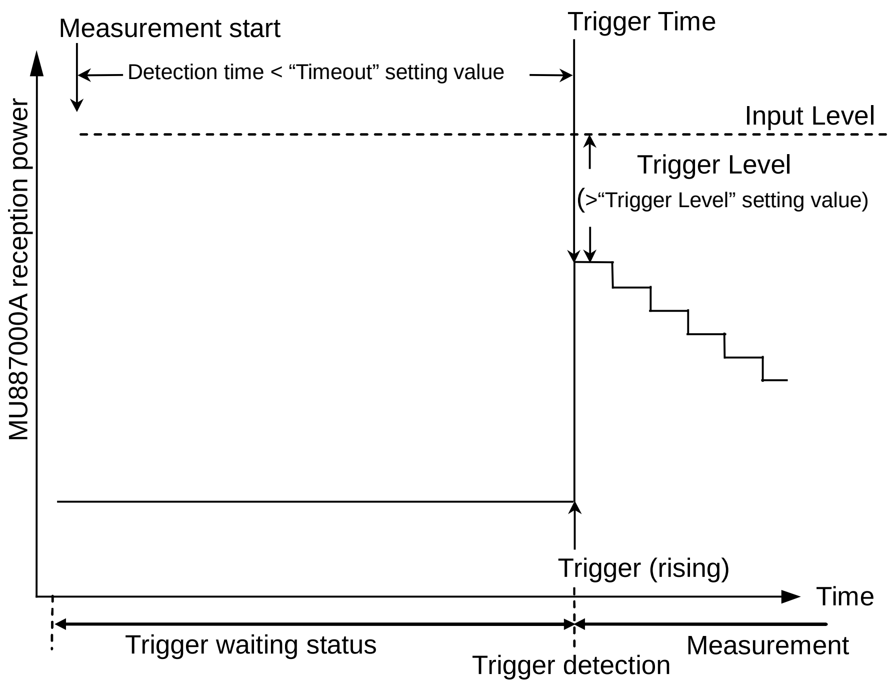


Figure 2.4.1-2 Trigger Detection Condition

2.4.2 Measurement results

Refer to Section 2.1.6 "Starting/stopping measurement" for how to start and stop Tx/Rx vs Frequency measurement start and query the status.

The Tx/Rx vs Frequency measurement result is the average power at each segment.
Query the Tx/Rx vs Frequency measurement result using the following command:

```
TX_RX_FREQ
:FETCh:CELLular:COMMon:TRXFrequency:LEVel
```

The response l(1), l(2), l(3),….l(n) is the average power of each segment. n = (Segment count – 1) × Sequence count. The power in the last segment of each sequence is not measured because the frequency changes.

2.4.3 Setting input level

The RF signal level changes with time during Tx/Rx vs Frequency measurement. The input level can be changed in the middle segment of a sequence to optimize the input level for the RF signal level.

The input level can be changed at the beginning of any segment using the MX887010A. Changes can be set for up to 99 segments and the segments are common for sequences.

Use the command below to set the input level.

```
REGMTXREF
:CONFigure:CELLular:COMMon:TRXFrequency:TXRef
```

Set input level control On/Off at the first parameter.
When the first parameter is Off, the input level is the value set at the input level as described in Section 2.1.3 “Frequency and level”.
When the first parameter is On, set the first level, level change step, and level after the change at the second and subsequent parameters.

If the input level is not to be changed during the Tx/Rx vs Frequency measurement set:
`REGMTXREF OFF`

If the input level of the header segment, the input level of 20th and subsequent segments, and the input level of 30th and subsequent segments are to be set to 24, 0, and –20 dBm, respectively, set:
`REGMTXREF ON,24,20,0,30,-20`

Attenuator switching requires 500 μs to change the input level. A result measured during this 500 μs is inaccurate, so the invalid value (999.99) can be displayed for such results by using the following command:

```
TX_RX_INV_RSLT_OUT
:CONFigure:CELLular:COMMon:TRXFrequency:IROutput
```

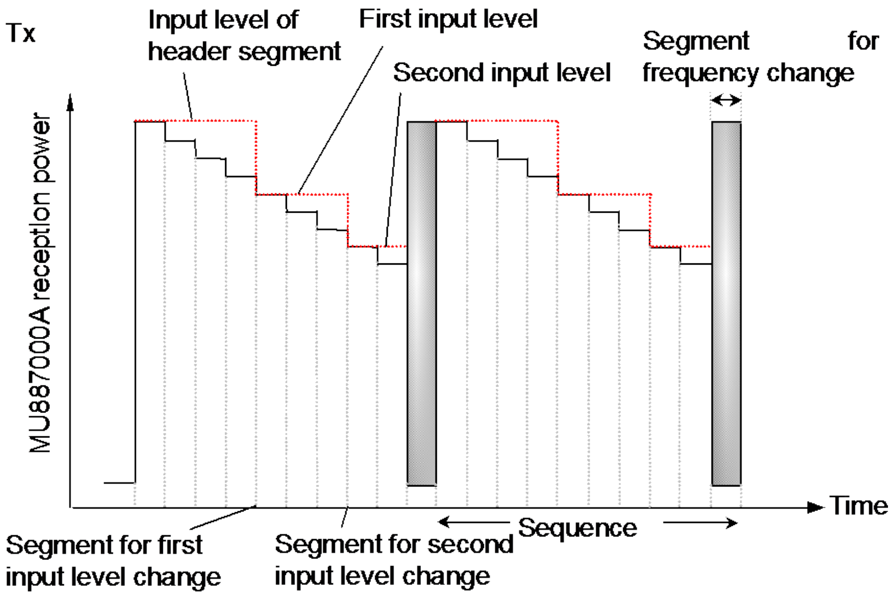


Figure 2.4.3-1 Input Level Setting Example

2.4.4 Commands

The Tx/Rx vs Frequency measurement can be set and queried using the following commands:

- Frequency
  Sequence 0 to 399
  REGTX_RX_FREQ
  :CONFigure:CELLular:COMMon:TRXFrequency:FREQuency
  Sequence 10 to 19
  REGTX_RX_FREQ2
  :CONFigure:CELLular:COMMon:TRXFrequency:FREQuency2
  Sequence 20 to 29
  REGTX_RX_FREQ3
  :CONFigure:CELLular:COMMon:TRXFrequency:FREQuency3
  Sequence 30 to 39
  REGTX_RX_FREQ4
  :CONFigure:CELLular:COMMon:TRXFrequency:FREQuency4
  Sequence 40 to 49
  REGTX_RX_FREQ5
  :CONFigure:CELLular:COMMon:TRXFrequency:FREQuency5
  Sequence 50 to 59
  REGTX_RX_FREQ6
  :CONFigure:CELLular:COMMon:TRXFrequency:FREQuency6
  Sequence 60 to 69
  REGTX_RX_FREQ7
  :CONFigure:CELLular:COMMon:TRXFrequency:FREQuency7
  Sequence 70 to 79
  REGTX_RX_FREQ8
  :CONFigure:CELLular:COMMon:TRXFrequency:FREQuency8
  Sequence 80 to 89
  REGTX_RX_FREQ9
  :CONFigure:CELLular:COMMon:TRXFrequency:FREQuency9
  Sequence 90 to 99
  REGTX_RX_FREQ10
  :CONFigure:CELLular:COMMon:TRXFrequency:FREQuency10
  Sequence 100 to 109
  REGTX_RX_FREQ11
  :CONFigure:CELLular:COMMon:TRXFrequency:FREQuency11
  Sequence 110 to 119
  REGTX_RX_FREQ12
  :CONFigure:CELLular:COMMon:TRXFrequency:FREQuency12
  Sequence 120 to 129
  REGTX_RX_FREQ13
  :CONFigure:CELLular:COMMon:TRXFrequency:FREQuency13

Sequence 130 to 139

REGTX_RX_FREQ14

:CONFigure:CELLular:COMMon:TRXFrequency:FREQuency14

Sequence 140 to 149

REGTX_RX_FREQ15

:CONFigure:CELLular:COMMon:TRXFrequency:FREQuency15

Sequence 150 to 159

REGTX_RX_FREQ16

:CONFigure:CELLular:COMMon:TRXFrequency:FREQuency16

Sequence 160 to 169

REGTX_RX_FREQ17

:CONFigure:CELLular:COMMon:TRXFrequency:FREQuency17

Sequence 170 to 179

REGTX_RX_FREQ18

:CONFigure:CELLular:COMMon:TRXFrequency:FREQuency18

Sequence 180 to 189

REGTX_RX_FREQ19

:CONFigure:CELLular:COMMon:TRXFrequency:FREQuency19

Sequence 190 to 199

REGTX_RX_FREQ20

:CONFigure:CELLular:COMMon:TRXFrequency:FREQuency20

Sequence 200 to 209

REGTX_RX_FREQ21

:CONFigure:CELLular:COMMon:TRXFrequency:FREQuency21

Sequence 210 to 219

REGTX_RX_FREQ22

:CONFigure:CELLular:COMMon:TRXFrequency:FREQuency22

Sequence 220 to 229

REGTX_RX_FREQ23

:CONFigure:CELLular:COMMon:TRXFrequency:FREQuency23

Sequence 230 to 239

REGTX_RX_FREQ24

:CONFigure:CELLular:COMMon:TRXFrequency:FREQuency24

Sequence 240 to 249

REGTX_RX_FREQ25

:CONFigure:CELLular:COMMon:TRXFrequency:FREQuency25

Sequence 250 to 259

REGTX_RX_FREQ26

:CONFigure:CELLular:COMMon:TRXFrequency:FREQuency26

Sequence 260 to 269

REGTX_RX_FREQ27

:CONFigure:CELLular:COMMon:TRXFrequency:FREQuency27

Sequence 270 to 279

REGTX_RX_FREQ28

:CONFigure:CELLular:COMMon:TRXFrequency:FREQuency28

Sequence 280 to 289

REGTX_RX_FREQ29

:CONFigure:CELLular:COMMon:TRXFrequency:FREQuency29

Sequence 290 to 299

REGTX_RX_FREQ30

:CONFigure:CELLular:COMMon:TRXFrequency:FREQuency30

Sequence 300 to 309

REGTX_RX_FREQ31

:CONFigure:CELLular:COMMon:TRXFrequency:FREQuency31

Sequence 310 to 319

REGTX_RX_FREQ32

:CONFigure:CELLular:COMMon:TRXFrequency:FREQuency32

Sequence 320 to 329

REGTX_RX_FREQ33

:CONFigure:CELLular:COMMon:TRXFrequency:FREQuency33

Sequence 330 to 339

REGTX_RX_FREQ34

:CONFigure:CELLular:COMMon:TRXFrequency:FREQuency34

Sequence 340 to 349

REGTX_RX_FREQ35

:CONFigure:CELLular:COMMon:TRXFrequency:FREQuency35

Sequence 350 to 359

REGTX_RX_FREQ36

:CONFigure:CELLular:COMMon:TRXFrequency:FREQuency36

Sequence 360 to 369

REGTX_RX_FREQ37

:CONFigure:CELLular:COMMon:TRXFrequency:FREQuency37

Sequence 370 to 379

REGTX_RX_FREQ38

:CONFigure:CELLular:COMMon:TRXFrequency:FREQuency38

Sequence 380 to 389

REGTX_RX_FREQ39

:CONFigure:CELLular:COMMon:TRXFrequency:FREQuency39

Sequence 390 to 399

REGTX_RX_FREQ40

:CONFigure:CELLular:COMMon:TRXFrequency:FREQuency40

- Input level
  REGMTXREF
  :CONFigure:CELLular:COMMon:TRXFrequency:TXRef
- Output level
  Segment 0 to 71
  REGMRXPWR
  :CONFigure:CELLular:COMMon:TRXFrequency:RXLevel
  Segment 36 to 71
  REGMRXPWR2
  :CONFigure:CELLular:COMMon:TRXFrequency:RXLevel2
- Filter
  TX_RX_FLT
  :CONFigure:CELLular:COMMon:TRXFrequency:FILTer
- Sequence count
  TX_RX_NUMSEQ
  :CONFigure:CELLular:COMMon:TRXFrequency:SEQuence:NUMBer
- Segment count
  TX_RX_NUMSEG
  :CONFigure:CELLular:COMMon:TRXFrequency:SEGMent:NUMBer
- Segment duration
  TX_RX_SEG_DURATION
  :CONFigure:CELLular:COMMon:TRXFrequency:SEGMent:DURation
- Measurement window
  TX_RX_MW
  :CONFigure:CELLular:COMMon:TRXFrequency:PERiod
- How to output invalid measurement results
  TX_RX_INV_RSLT_OUT
  :CONFigure:CELLular:COMMon:TRXFrequency:IROutput
- Trigger level
  TX_RX_TRG_LVL
  :TRIGger:CELLular:COMMon:TRXFrequency:THReshold
- Trigger delay time
  TX_RX_TRG_DLY
  :TRIGger:CELLular:COMMon:TRXFrequency:DELay
- Trigger timeout time
  TX_RX_TIMEOUT
  :TRIGger:CELLular:COMMon:TRXFrequency:TOUT
- Power measurement result count
  TX_RX_FREQ_NUM
  :FETCh:CELLular:COMMon:TRXFrequency:LEVel:NUMBer
- Power measurement result
  TX_RX_FREQ
  :FETCh:CELLular:COMMon:TRXFrequency:LEVel

2.4.5 Example of Tx/Rx vs Frequency measurement

An example of how to measure the average power of each segment of a signal with four sequences and 101 segments in the Native command mode is described here.

The sample program on the following pages can be executed as a Tera Term macro. Refer to the Tera Term Help file for how to execute the macro.

Processing flow

1. Set the application type to CELLULAR.
2. Set the measurement standard to the MX887010A fundamental measurement.
3. Set the measurement to Tx/Rx vs. Frequency.
4. Set the following measurement conditions:

Test port	Port 1	
Center frequency	Sequence 0	2110 MHz
	Sequence 1	1920 MHz
	Sequence 2	2170 MHz
	Sequence 3	1980 MHz
Input level	20.0 dBm	
Output level	–80 dBm	
	Segment 0	–80 dBm
	Segment 1/2	–85 dBm
	Segment 3/4	–90 dBm
Filter	3.84 MHz	
Sequence count	4	
Segment count	101	
Segment duration	10 ms	
Offset	10%	
Measurement interval		80%
Trigger level	–40 dB	
Trigger timeout	30 s	
RF signal output	On	

5. Set the VSG as follows:

Modulation	Off
Operation mode	Sequence

6. Initialize the status registers.
7. Start measurement.
8. Read the status registers.
9. When measurement is completed, query the following values:

   Power measurement result count

   Power measurement result for each sequence

```
; Sample program for Tx/Rx vs Frequency
; Anritsu Corporation March,2012
; Macro for Tera Term Version 4.69
;
; set local echo to on
setecho 1
flushrecv
; time out 10 second
timeout=10

; Set language to "Native".
sendln 'SYST:LANG NAT'
call check_error_code

; Set application type to "Cellular".
sendln 'SYSSEL CELLULAR'
call check_error_code

; Set standard to "Common".
sendln 'STDSEL COMMON'
call check_error_code

; Set measurement to "Tx/Rx vs Frequency".
sendln 'MEASSEL TRXFREQ'
call check_error_code

; Set test port to "Port1".
sendln 'PORT PORT1,PORT1'
call check_error_code

; Set frequency to "2110,1920,2170,1980".
sendln 'REGTX_RX_FREQ 2110,1920,2170,1980'
call check_error_code

; Set Input Range to "20 dBm".
sendln 'ILVL 20'
call check_error_code

; Set Output Range to "-80 dBm".
sendln 'OLVL -80'
call check_error_code

; Set Output Range of segment to "-80,-85,-85,-90,-90 dBm".
sendln 'REGMRXPWR -80,-85,-85,-90,-90'
```

```
call check_error_code

; Set filter to "RRC (3.84 MHz)".
sendln 'TX_RX_FLT RRC'
call check_error_code

; Set Number of Sequence to "4".
sendln 'TX_RX_NUMSEQ 4'
call check_error_code

; Set Number of Segment to "101".
sendln 'TX_RX_NUMSEG 101'
call check_error_code

; Set Segment Duration to "10 ms".
sendln 'TX_RX_SEG_DURATION 10'
call check_error_code

; Set offset to "10%",duration to "80%".
sendln 'TX_RX_MW 10,80'
call check_error_code

; Set Trigger Level to "-40 dBm".
sendln 'TX_RX_TRG_LVL -40'
call check_error_code

; Set Trigger Time out to "30 s".
sendln 'TX_RX_TIMEOUT 30'
call check_error_code

; Set Output State to "On".
sendln 'LVL ON'
call check_error_code

; Set Modulation to "Off".
sendln 'MOD OFF'
call check_error_code

; Set VSG mode to sequence
sendln 'SOUR:GPRF:GEN:MODE SEQUENCE'
call check_error_code

; Clear event registers.
sendln '*CLS'
```

```
call check_error_code

; Start measurement
sendln 'SNGLS'
call check_error_code

; query event status register
  sendln 'ESE2?'
  waitln '0' '1'
call check_error_code

; waiting measurement up to 10 second
for i 1 10

  sendln 'ESE2?'
  pause 1; wait 1 second
  recvln
  recvln
  ;call check_response ; debug
  if result=0 goto _timeout
  if result=1 then
         break
  endif
  call check_error_code
next

; Query number of power data points
sendln 'TX_RX_FREQ_NUM?'
call check_error_code

; Query power data
sendln 'TX_RX_FREQ?
call check_error_code

messagebox  'Macro end successfully' 'Finish'

End

;       ------------ subroutines -----------

:check_error_code
  ; query error
  sendln 'SYSERR?'
  waitln 'No error'
```

```
  ; in case of timeout
  if result=0 goto _timeout
  ; in case of error occurring
  if result=2 then
         e_message='Error code = '
         strconcat e_message inputstr
         messagebox  e_message 'Command Error occurred'
         end
  endif

  ; in case of no error

return

:check_response

  ;for debug
  messagebox inputstr 'debug1'
  int2str result_str result
  messagebox result_str 'debug2'

  return

:_timeout
  messagebox  'No response from MT8870A.' 'Time out!'
  call check_error_code
  End
```

2.5 Narrowband Power vs Time Measurement

The Narrowband Power vs Time measurement function measures the MU887000A Rx power at a fixed time interval similar to multiple power measurement. Unlike multiple power measurement, the power is measured after the signal has passed through a narrow bandpass filter. As a result, the power of the target signal can be measured without any effect from nearby spectrums. This measurement is used to measure the sideband power of digital modulated signals, etc.

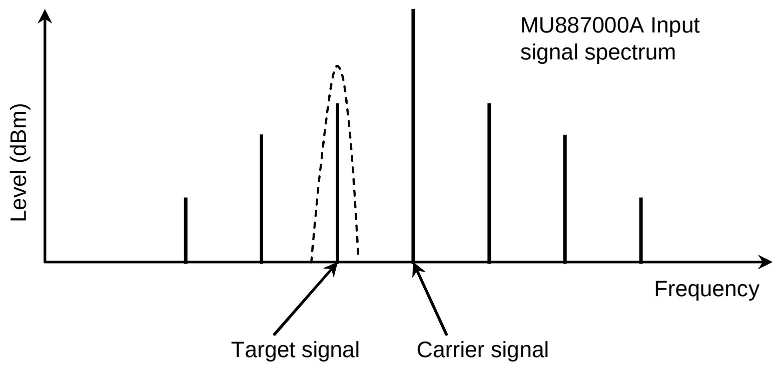


Figure 2.5-1 Signal Measured with Narrowband Power vs Time (Target Signal)

Up to 1000 segments can be set for a longer measurement than the multiple power measurement.

2.5.1 Target signal conditions

The target signal conditions are:

- Trigger detection conditions
  Measurement is started using the rising power of the input target signal as a trigger.
  The trigger level is "Input level setting value –30 dB".
- Tx power
  Set the Tx power (sum of the carrier signal power and target signal power) to "Input level setting value" or less.
  At detection of a power that greatly exceeds the "Input level setting value", the error status becomes Level Over and measurement is stopped.
- Carrier signal
  The difference between the frequency of the carrier signal and target signal must be more than 50 kHz. If it is less than 50 kHz, the Tx power cannot be measured accurately.

Figure 2.5.1-1 shows an example of a target signal.

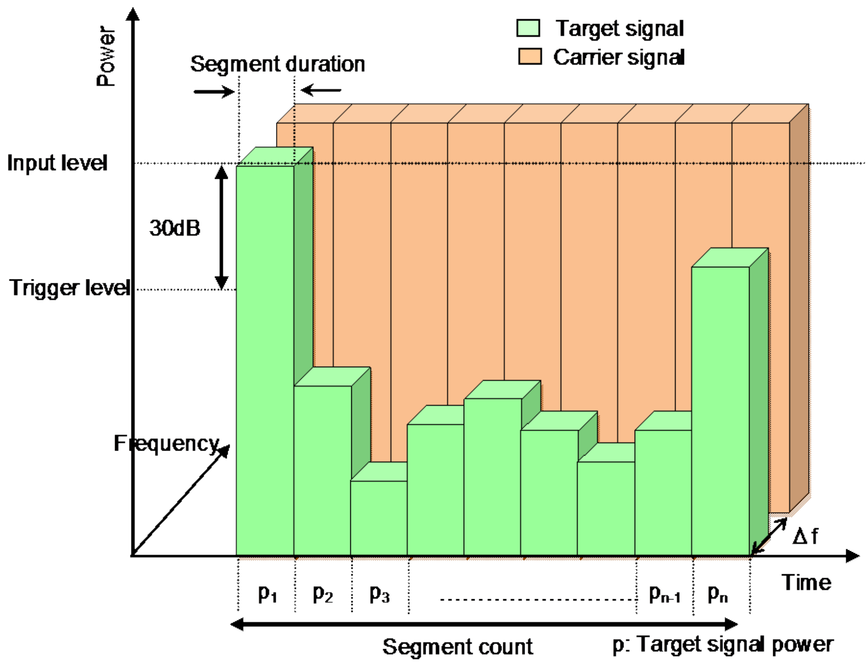


Figure 2.5.1-1 Narrowband Power vs Time Signal Example

2.5.2 Setting measurement conditions

The Narrowband Power vs Time measurement settings are listed below. At Narrowband Power vs Time measurement, the trigger level is fixed by a level of –30.0 dB level from the input level.

Frequency
Set the RF signal frequency of the measurement target.

Input level
Set the level of RF signals input to the MU887000A.

Segment count
Set the segment count (1 to 1000) for one sequence. The segment count includes frequency change segments.

Segment duration
Set the segment duration (200 to 20000 μs) in 1-μs steps.

Measurement window
Set the measurement interval and offset with a proportional ratio (%) to the segment duration. Set the offset and measurement interval so the total is less than or equal to 100%.

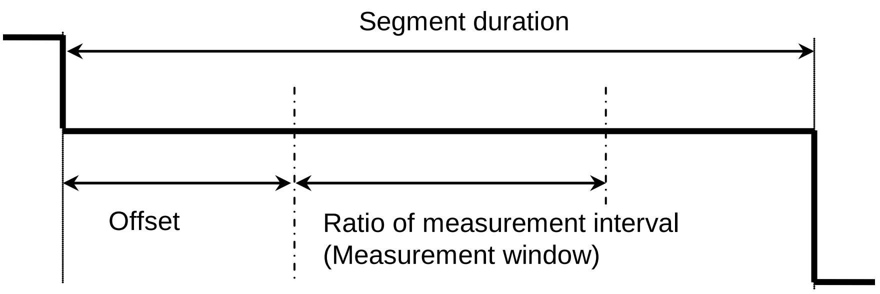


Figure 2.5.2-1 Measurement Window

Trigger timeout time
This is maximum trigger wait time. If there is no trigger within this time, measurement is stopped and a trigger timeout error occurs. Set at time from 1 to 30 s.

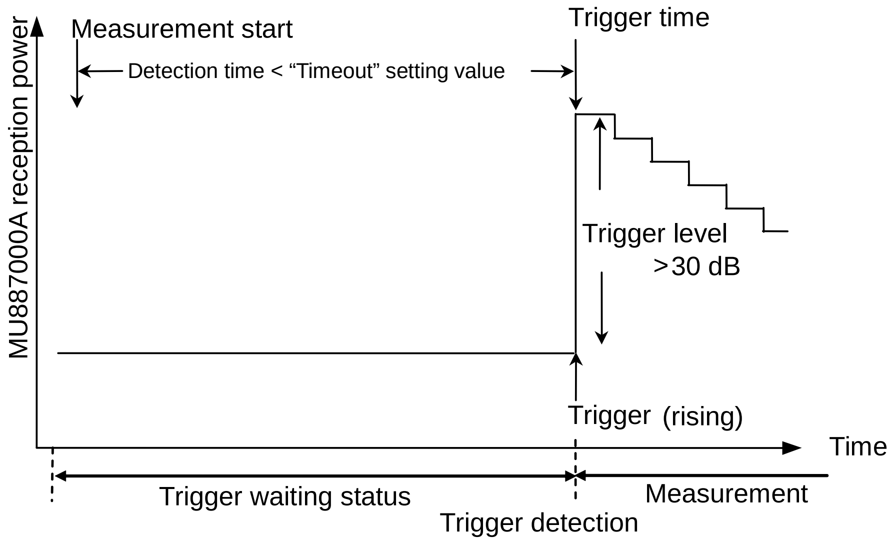


Figure 2.5.2-2 Trigger Detection Condition

2.5.3 Measurement results

Refer to Section 2.1.6 "Starting/stopping measurement" for how to start and stop Narrowband Power vs Time measurement and query the status. Measurement ends when the segment count time has elapsed after measurement started.

The measurement result is the power measured at each segment. Query the Narrowband Power vs Time measurement results using the following command:

```
NBANDPVT_POWER
:FETCh:CELLular:COMMon:NARRowband:POWer
```

To set the read range, specify the read start segment number and read segment count at the parameters.
l(1) of the response l(1), l(2), l(3), …l(n-1) is the segment average power (dBm); l(2) and subsequent values are the levels (dB) relative to l(1).

2.5.4 Commands

The following commands are used to set and query Narrowband Power vs Time measurement:

- Frequency and level
  Refer to "Uplink frequency" and "Input level" in Section 2.1.3 "Frequency and level".
- Segment duration and segment count
  `NBANDPVT_SEG`
  `:CONFigure:CELLular:COMMon:NARRowband:SEGMent`
- Measurement window
  `NBANDPVT_MW`
  `:CONFigure:CELLular:COMMon:NARRowband:PERiod`
- Trigger timeout time
  `NBANDPVT_TIMEOUT`
  `:TRIGger:CELLular:COMMon:NARRowband:TOUT`
- Power measurement result
  `NBANDPVT_POWER`
  `:FETCh:CELLular:COMMon:NARRowband:POWer`

2.5.5 Narrowband Power vs Time measurement example

An example of Narrowband Power vs Time measurement in the SCPI command mode is described here.

The sample program on the following pages can be executed as a Tera Term macro. Refer to the Tera Term Help file for how to execute the macro.

Processing flow

1. Set the application type to CELLULAR.
2. Set the measurement standard to MX887010A fundamental measurement.
3. Set the setting item to Narrowband Power vs Time.
4. Set the following measurement conditions:

Test port	Port 3
Frequency	890.2 MHz
Input level	25 dBm
Trigger timeout	20 s
Segment duration	1 ms
Segment count	200
Offset	10%
Measurement window	80%

5. Initialize the status registers.
6. Start measurement.
7. Read the status registers.
8. When measurement is completed, query the power measurement results.

```
; Sample program for Narrowband Power vs Time
; Anritsu Corporation March,2012
; Macro for Tera Term Version 4.69
;
; set local echo to on
setecho 1
flushrecv
; time out 3 second
timeout=3

; Set language to "SCPI".
sendln 'SYST:LANG SCPI'
call check_error_code

; Set application type to "Cellular".
sendln ':INST CELLULAR'
call check_error_code

; Set standard to "Common".
sendln ':CONF:CELL:MEAS:STAN COMMON'
call check_error_code

; Set measurement to "Narrowband Power vs Time".
sendln ':CONF:CELL:MEAS:SEL NBANDPVT'
call check_error_code

; Set test port to "Port3".
sendln ':ROUT:PORT:CONN:DIR PORT3,PORT1'
call check_error_code

; Set Input Frequency to "890.2 MHz".
sendln ':CONF:CELL:MEAS:RFS:ULFREQ 890200KHZ'
call check_error_code

; Set Input Level to "25 dBm".
sendln ':CONF:CELL:MEAS:RFS:LEV 25'

; Set Timeout to "20 s".
sendln ':TRIG:CELL:COMM:NARR:TOUT 20'
call check_error_code

; Set Segment Length to "1 ms", Number of Segment to "200".
sendln ':CONF:CELL:COMM:NARR:SEGM 1000,200'
call check_error_code
```

```
; Set offset to "10%",duration to "80%".
sendln ':CONF:CELL:COMM:NARR:PER 10,80'
call check_error_code

; Preset status registers.
sendln '*CLS'
sendln ':STAT:PRESET'
call check_error_code

; ! Note !
; Output the RF power of Device under test.

; Start measurement
sendln ':INIT:CELL:MEAS:SING'
call check_error_code

; waiting measurement up to 10 second
for i 1 10

  sendln ':STAT:OPER:MEAS?'
  pause 1; wait 1 second
  recvln
  recvln
  ;call check_response ; debug
  if result=0 goto _timeout
  if result=1 then
         break
  endif
  call check_error_code
next

; Query spectrum data
sendln ':FETC:CELL:COMM:NARR:POW?'
call check_error_code

messagebox  'Macro end successfully' 'Finish'

End

;       ------------ subroutines -----------
:check_error_code
  ; query error
  sendln ':SYSTem:ERRor?'
```

```
  waitln 'No error'

  ; in case of timeout
  if result=0 goto _timeout
  ; in case of error occurring

  if result=2 then
         e_message='Error code = '
         strconcat e_message inputstr
         messagebox  e_message 'Command Error occurred'
         end
  endif

  ; in case of no error

return

:check_response

  ;for debug
  messagebox inputstr 'debug1'
  int2str result_str result
  messagebox result_str 'debug2'

  return

:_timeout
  messagebox  'No response from MT8870A.' 'Time out!'
  call check_error_code
  End
```

2.6 IQ Capture

IQ Capture function outputs signals sent from mobile stations as bandwidth-limited baseband signals.

2.6.1 Target signal conditions

The target signal conditions are:

- Trigger detection conditions
  Measurement is started using the rising power of the input target signal as a trigger.
  Set the trigger level in the range from −3 to −30 dB with reference to the input level setting.
- Tx power
  Set the Tx power (sum of the carrier signal power and target signal power) so that it is equal to or less than "Input level setting value". If a power that greatly exceeds the "Input level setting value" is detected, the error status becomes Level Over and measurement is stopped.

Figure 2.6.1-1 shows an example of a target signal.

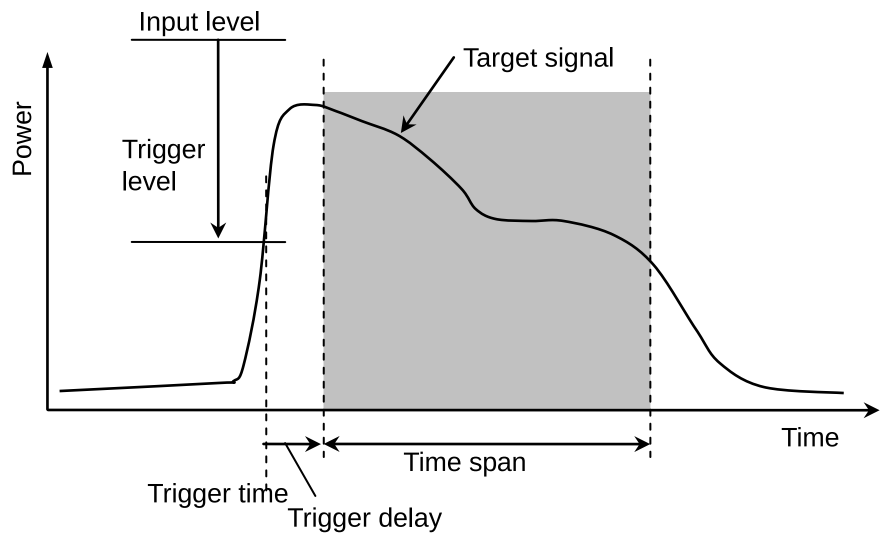


Figure 2.6.1-1 IQ Capture Signal Example

2

Fundamental Measurements

2.6.2 Setting measurement conditions

IQ Capture settings are listed below.

Frequency
Set the RF signal frequency of the measurement target.

Input level
Set the level of RF signals input to the MU887000A.

Time span
Set the time to capture IQ data in the range from 1,000 to 10,000 μs.

Measurement bandwidth
The bandwidth of the baseband signals can be limited. Set the measurement bandwidth from the following values:
Low Pass Filter: 100, 300, 500 kHz, 1, 3, 5, 10, 20 MHz
Gaussian filter: GSM (1 MHz)

Trigger level
Set the trigger level to start IQ capturing as the level difference from the input level in the range from –30.0 to –3 dB.

Trigger delay
Set the relative value from the trigger detection point to the measurement start point. Set at time from –500 to 500 μs.

Trigger timeout time
This is maximum trigger wait time. If there is no trigger within this time, measurement is stopped and a trigger timeout error occurs. Set at time from 1 to 30 s.

2.6.3 Measurement results

Refer to Section 2.1.6 “Starting/stopping measurement” for how to start and stop the IQ Capture and query the status.
When a trigger occurs after the measurement starts, the IQ Capture starts after the trigger delay elapses. The IQ Capture ends after the time span elapses.

The measurement result of the IQ Capture is the IQ data captured. Query the results using the following command:

```
IQCAP_BIN
:FETCh:CELLular:COMMon:IQCapture:IQData
```

The sampling rate and number of samples of captured IQ data can be obtained as well.

2.6.4 Commands

The following commands are used to set and query the IQ Capture:

- Frequency and level
  Refer to the "Uplink frequency" and "Input level" in Section 2.1.3 "Frequency and level".
- Time span
  `IQCAP_TSPAN`
  `:CONFigure:CELLular:COMMon:IQCapture:TSPan`
- Measurement bandwidth
  `IQCAP_BW`
  `:CONFigure:CELLular:COMMon:IQCapture:FILTer`
- Trigger level
  `IQCAP_TRGLVL`
  `:TRIGger:CELLular:COMMon:IQCapture:THReshold`
- Trigger delay
  `IQCAP_TRGDLY`
  `:TRIGger:CELLular:COMMon:IQCapture:DELay`
- Trigger timeout time
  `IQCAP_TIMEOUT`
  `:TRIGger:CELLular:COMMon:IQCapture:TOUT`
- Sampling rate
  `IQCAP_RATE`
  `:FETCh:CELLular:COMMon:IQCapture:SRATe`
- Number of samples
  `IQCAP_NUM`
  `:FETCh:CELLular:COMMon:IQCapture:SAMPles`
- IQ data
  `IQCAP_BIN`
  `:FETCh:CELLular:COMMon:IQCapture:IQData`

2.6.5 IQ Capture measurement example

An example of IQ Capture measurement in the Native command mode is described here.

The sample program on the following pages can be executed as a Tera Term macro. Refer to the Tera Term Help file for how to execute the macro.

Processing flow

1. Set the application type to CELLULAR.
2. Set the measurement standard to the MX887010A fundamental measurement.
3. Set the measurement to IQ capture.
4. Set the following measurement conditions:

Test port	Port 1
Center frequency	890.2 MHz
Input level	10.0 dBm
Measurement bandwidth	1 MHz
Trigger level	–20 dB
Trigger delay	–100 µs
Trigger timeout	10 s
Time span	5000 µs

5. Initialize the status registers.
6. Start measurement.
7. Read the status registers.
8. When capture is completed, query the following values:

   Sampling rate
   Number of sampling
   IQ data

```
; Sample program for IQ Capture
; Anritsu Corporation August,2012
; Macro for Tera Term Version 4.69
;
; set local echo to on
setecho 1
flushrecv
; time out 10 second
timeout=10

; Set language to "Native".
sendln 'SYST:LANG NAT'
call check_error_code

; Set application to "Cellular".
sendln 'SYSSEL CELLULAR'
call check_error_code

; Set standard to "Common".
sendln 'STDSEL COMMON'
call check_error_code

; Set measurement to "IQ Capture".
sendln 'MEASSEL IQCAP'
call check_error_code

; Set test port to "Port1".
sendln 'PORT PORT1,PORT1'
call check_error_code

; Set frequency to "890.2 MHz".
sendln 'ULFREQ 890.2MHZ'
call check_error_code

; Set input range to "10 dBm".
sendln 'ILVL 10'
call check_error_code

; Set measurement bandwidth to "1 MHz".
sendln 'IQCAP_BW 1MHZ'
call check_error_code

; Set trigger level to "-20 dB".
sendln 'IQCAP_TRGLVL -20'
```

```
call check_error_code

; Set trigger delay to "-100 us".
sendln 'IQCAP_TRGDLY -100'
call check_error_code

; Set trigger time out to "10 s".
sendln 'IQCAP_TIMEOUT 10'
call check_error_code

; Set time span to "5000 us".
sendln 'IQCAP_TSPAN 5000'
call check_error_code

; Clear event registers.
sendln '*CLS'
call check_error_code

; Start measurement
sendln 'SNGLS'
call check_error_code

; query event status register
  sendln 'ESR2?'
  waitln '0' '1'
call check_error_code

; waiting measurement up to 10 second
for i 1 10

  sendln 'ESR2?'
  pause 1; wait 1 second
  recvln
  recvln
  ;call check_response ; debug
  if result=0 goto _timeout
  if result=1 then
         break
  endif
  call check_error_code
next

; Query sampling rate
sendln 'IQCAP_RATE?'
```

```
recvln
recvln
if result=0 goto _timeout

; Query the number of sampling points
sendln 'IQCAP_NUM?'
recvln
recvln
if result=0 goto _timeout
if result=1 then
  str2int sample_num inputstr
  int2str iq_num sample_num
  iq_query= 'IQCAP_BIN? 2,0,100'
  strconcat iq_query iq_num

  ; Query IQ data
  sendln iq_query
  recvln
  recvln
  if result=0 goto _timeout
  if result=1 then
         fileopen fhandle 'iq_data.txt' 0
         filewrite fhandle inputstr
         fileclose fhandle
         pause 2
         messagebox  'Macro end successfully' 'Finish'
  endif

endif

End

;       ------------ subroutines -----------

:check_error_code
  ; query error
  sendln 'SYSERR?'
  waitln 'No error'

  ; in case of timeout
  if result=0 goto _timeout
  ; in case of error occurring
  if result=2 then
         e_message='Error code = '
```

```
        strconcat e_message inputstr
        messagebox  e_message 'Command Error occurred'
        end
  endif

  ; in case of no error

return

:check_response

  ;for debug
  messagebox inputstr 'debug1'
  int2str result_str result
  messagebox result_str 'debug2'

  return

:_timeout
  messagebox  'No response from MT8870A.' 'Time out!'
  call check_error_code
  End
```

Chapter 3 Sequence Measurement

This chapter describes sequence measurement setup and control.

3.1 Sequence Measurement Introduction

3.1.1 Operation details

The sequence measurement function is used to measure received signals by changing frequencies, levels, and transmission signal patterns according to measurement conditions in a sequence table.

A sequence consists of multiple measurement steps (segments). The segment length (duration) is specified in numeric units of time called a “step”. One measurement is executed at each step. The MU887000A output power can be changed at each step. Standards, such as W-CDMA and GSM, are supported by changing the time of one step.

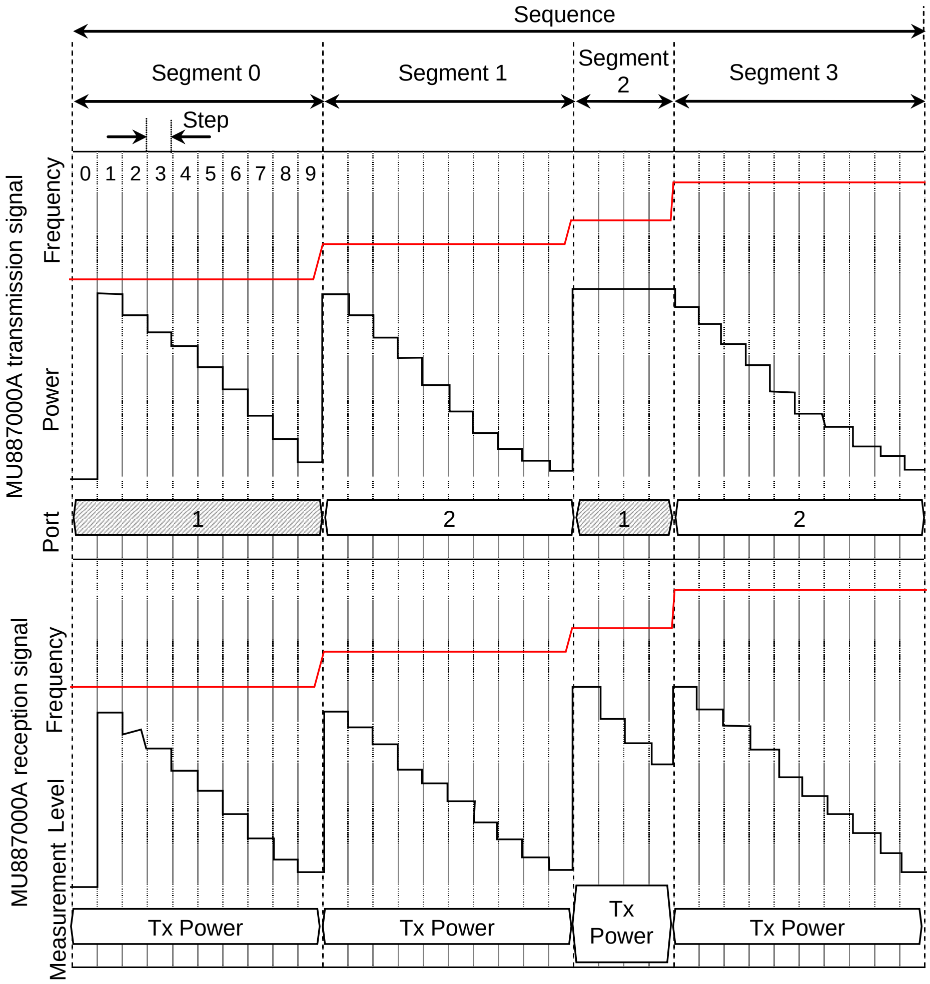


Figure 3.1.1-1 Sequence Operation Example

The following measurement items are set in each segment:

- MU887000A test port outputting RF signal
- MU887000A Tx frequency (downlink) and Rx frequency (uplink)
- MU887000A output level and reception level
- Trigger condition to start sequence
- Step count
- Modulated waveform pattern
- Measurement item
- Measurement condition number

A sequence measurement measures one of the following items.

- Rx Power (Rx power of mobile station)

The measurement conditions are listed in the measurement condition table, which is separate from the sequence table. When editing the sequence table, the measured items and measurement condition numbers should be set in segments.

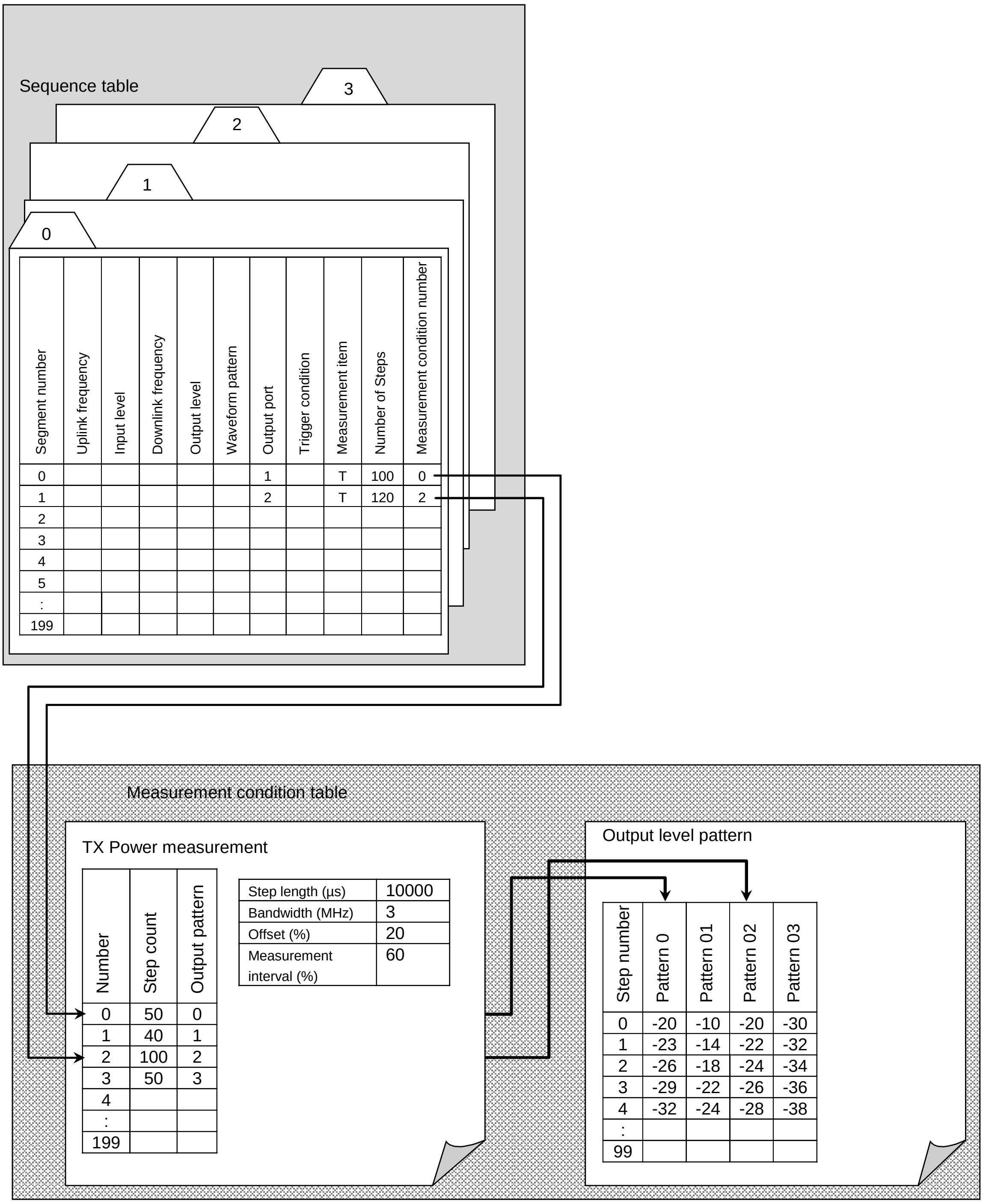


Figure 3.1.1-2 Data Structure of Sequence Measurement Conditions

3.1.2 Procedure

The sequence measurement procedure is shown below.

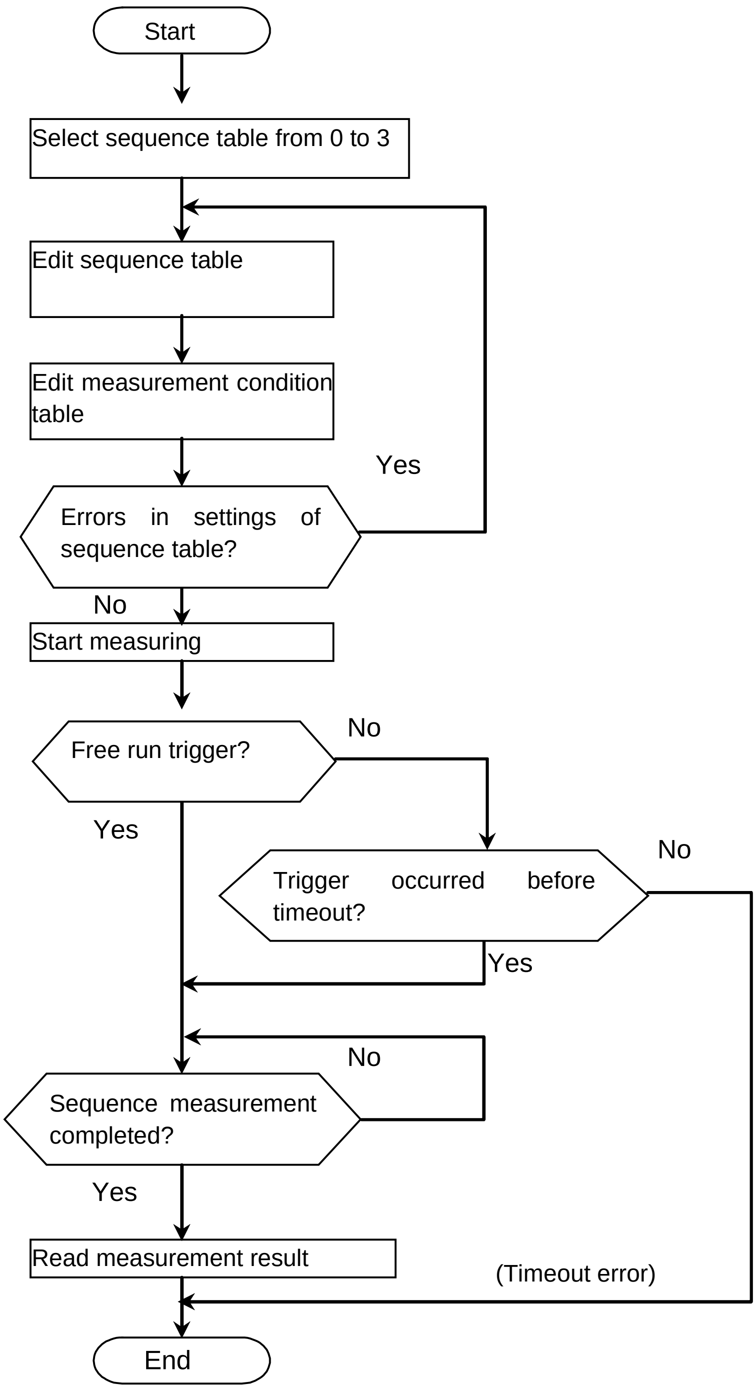


Figure 3.1.2-1 Sequence Measurement Basic Procedure

3.2 Setting Sequence Table

3.2.1 Sequence table setting items

The sequence table setting items are:

- Table number
- Uplink frequency
- Input level
- Downlink frequency
- Output level
- Waveform pattern
- Output port
- Trigger condition
- Measurement item
- Number of steps
- Measurement condition number

Table number
This is the number allocated to the edited sequence table. Four sequence tables are used and each table has a number between 0 and 3.

Rx frequency, Input level, Tx frequency, Output level, Waveform pattern
Each segment of the sequence table is configured with frequencies (MHz) and levels (dBm) and a modulation waveform pattern number. The setting ranges are:

Frequency:	400.000000 to 3800.000000 MHz
Input level:	–65.0 to +35.0 dBm (Test report 1, 2)
	–65.0 to +25.0 dBm (Test Port 3, 4)
Output level:	–130.0 to –10.0 dBm (Test report 1, 2)
	–120.0 to 0.0 dBm (Test Port 3, 4)

Waveform pattern: PAT1 to PATn, CW, OFF, NC
n: waveform information file group range

For details of the modulated waveform patterns, refer to Section 2.1.5 “Waveform patterns”.

Output port
This sets the number of the RF Signal port to 1 to 4 in each segment of the sequence table.
When selecting Port 3 or 4, make sure the port number is not the same as the input port.

Trigger condition
This specifies the trigger condition at each segment of the sequence table.
The setting ranges are:
Trigger source
  Frame: When frame is detected
  Free run: Starts sequence measurement immediately

Power: Specified if input level above (or below) trigger level

Slope

Rise: Trigger occurs when input level exceeds trigger level

Trigger level

Specifies level difference from input level within range of –40.0 to 0 dB.

Measurement item, number of steps and measurement condition number
This sets the number of steps and the measurement item for received signals in each segment of the sequence table. The measurement item is specified as one of the following items.

Tx Power: Transmission power of mobile station (dBm)

The measurement conditions for each measurement item are specified in separate tables.

Seeing the corresponding table, specify the measurement condition numbers as well.

Note:

If the license of other cellular application software is installed, the measurement mode supported by the license can be set.

In this case, the measurement mode can be changed up to 15 times during the sequence.

Set the step count to the following values or more when Measurement item is Transmission power.

- Measurement Count + 1

The initial values of setting items in the sequence table are listed in the following table.

Table 3.2.1-1 Initial Values of Sequence Table

Setting	Value	Unit
Uplink frequency	1950	MHz
Input level	–10.0	dBm
Downlink frequency	2140	MHz
Output level	–60.0	dBm
Waveform pattern	CW	
Output port	PORT1	
Trigger source	FREERUN	
Slope	RISE	
Trigger level	–30	dB
Trigger delay time	0	ms
Measurement item	Transmission power	
Step count	2	
Measurement condition number	0	

3.2.2 Sequence table commands

The following commands set and query items in the sequence table.

- Table number
  `SEQTBL`
  `:CONFigure:CELLular:SEQuence:TABLe`
- Uplink frequency, Input level, Downlink frequency, Output level, Waveform pattern
  `SEQTRX`
  `:CONFigure:CELLular:SEQuence:RFSettings:TRX`
- Uplink frequency, Input level
  `SEQTX`
  `:CONFigure:CELLular:SEQuence:RFSettings:TX`
- Output port
  `SEQSGPORT`
  `:CONFigure:CELLular:SEQuence:RXPort`
- Trigger
  `SEQTRG`
  `:TRIGger:CELLular:SEQuence`
- Measurement mode, Number of steps, Measurement condition number
  `SEQMEAS`
  `:CONFigure:CELLular:SEQuence:SETup`

3.2.3 Setting item error check

Setting errors in the following items in the sequence table can be checked.

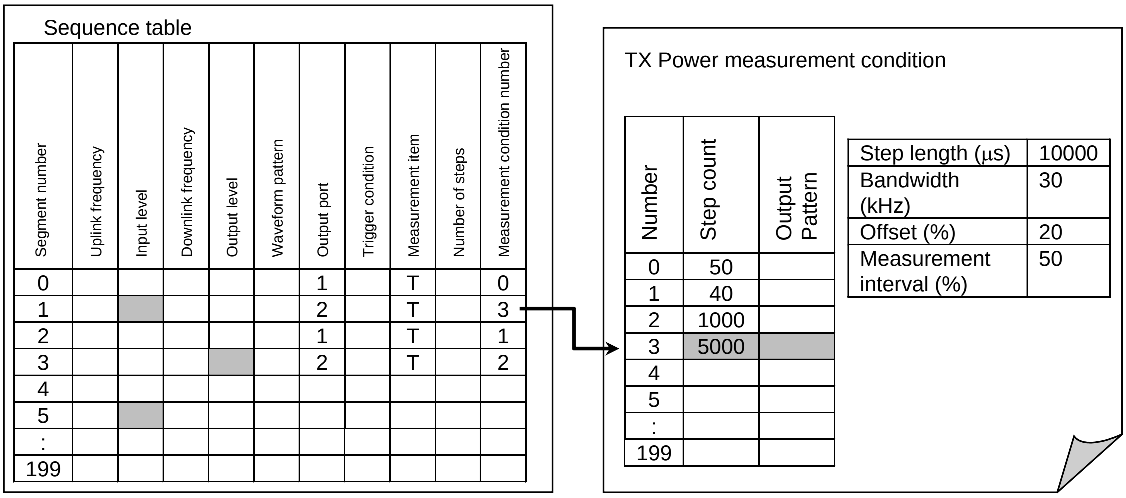
- Input level
- Output level
- Step count
- Waveform pattern
- Port
- Amount of capture memory
- Output level change count
- Waveform pattern change count
- Measurement mode change count

The following command is used to check for errors.

```
SEQERR
:FETCh:CELLular:SEQuence:ERRor
SEQERR2
:FETCh:CELLular:SEQuence:ERRor2
```

As an example, the sequence table included in the following chart has the following errors.

Segment number 1	Input level and step count
Segment number 3	Output level
Segment number 5	Input level



Sequence table

Segment number	Uplink frequency	Input level	Downlink frequency	Output level	Waveform pattern	Output port	Trigger condition	Measurement item	Number of steps	Measurement condition number
0						1		T		0
1						2		T		3
2						1		T		1
3						2		T		2
4										
5										
:										
199										

TX Power measurement condition

Number	Step count	Output Pattern
0	50	
1	40	
2	1000	
3	5000	
4		
5		
:		
199		

Step length (µs)	10000
Bandwidth (kHz)	30
Offset (%)	20
Measurement interval (%)	50

Figure 3.2.3-1 Sequence Table Error Example

The description below explains an operation example in the Native command mode.
First, check for errors in the sequence table using the following query.

```
SEQERR2? 1
>3,ILVL,OLVL,STEP
```

The response shows errors were found in three measurement items: input level, output level, and step count. Next, query the segment numbers for the errors.

```
SEQERR? ILVL
>2,1,5
SEQERR? OLVL
>1,3
SEQERR? STEP
>1,1
```

The responses above show that input level errors were found in two segment numbers—1 and 5.
Also an output level error was found in one segment number—3.
A step count error was found in one segment number—1.
Correct the values of located errors.

The setting ranges for input and output levels change depending on frequency when common external loss is used. When setting the frequency for sequence measurement, an error occurs if the level setting is out of range.

Query the usage of capture memory using the following command.

```
SEQERR? LEN
>0,36.6, 5,5
```

The second response parameter shows the memory use, which is 36.6% here. Sequence measurement cannot be executed if the memory use is more than 100%. Decrease the memory use to less than 100% by changing the capture conditions or decreasing the number of segments.
The following table lists the guidelines for the required capture memory for measuring one segment.

Table 3.2.3-1 Guidelines for Capture Memory Use

Measurement Mode	Capture Memory Use
Tx Power	0% (Capture memory not used)

Table 3.2.3-2 Error Cause

Parameter	Cause
Input level*	Input level is out of range.
Output level*	Output level is out of range.
Step count	Step count is shorter than frame length.
Waveform pattern	The specified waveform file is not loaded in the waveform memory. The specified waveform pattern does not exist in the waveform file.
Port	Port 3 is set for both input port and output port. Or Port 4 is set for both input port and output port.
Amount of capture memory	Memory use rate is 100% or above
Output level change count	Output level change count is 3001 or above.
Waveform pattern change count	Waveform pattern change count is 101 or above.
Measurement mode change count	Measurement mode change count is 16 or above.

*: The available level depends on the settings of port number and external loss.

Changing the waveform pattern to CW or NC is not counted as waveform pattern change. Some examples of how to count waveform pattern change are shown below.

Parameter Setting Command	Waveform Pattern Change Count
`SEQTRX 0,1950.00,-10.00,869.20,-60.00,PAT1`	1
`SEQTRX 1,1950.00,-10.00,869.20,-60.00,CW`	1
`SEQTRX 2,1950.00,-10.00,869.20,-60.00,PAT2`	2
`SEQTRX 3,1950.00,-10.00,869.20,-60.00,NC`	2
`SEQTRX 4,1950.00,-10.00,869.20,-60.00,PAT3`	3
`SEQTRX 5,1950.00,-10.00,869.20,-60.00,PAT1`	4

3.3 Setting Measurement Conditions Table

3.3.1 Setting Tx power items

To measure Tx power, set the measurement intervals within a step and record the average power at each interval.
The Tx power measurement settings are:

- Step length
- Step count
- Bandwidth
- Offset, measurement interval
- Output level pattern
- Output level per step

Up to 2000 items can be configured for step length and output level patterns. Allocate numbers 0 through 1999 to the set measurement conditions.

Step count
Configure the step count for Tx power measurement from 1 to 200.

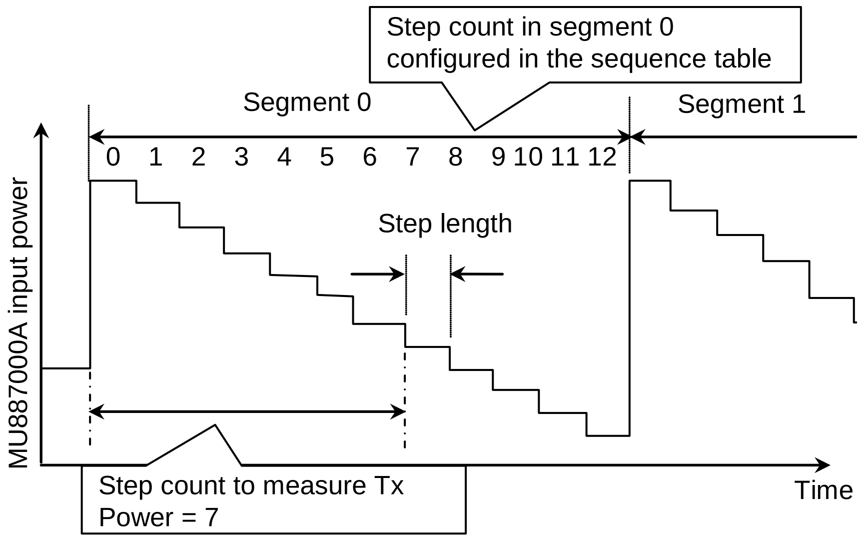


Figure 3.3.1-1 Step Count Setting Example

Step length
Select the step duration from:
Arbitrary duration: Set any duration from 1 to 80 ms in 1-ms steps.

W-CDMA:	(10/15) ms
CDMA2k:	1.25 ms
LTE:	0.5 ms
GSM:	(120/26/8) ms

Bandwidth
A filter can be set to remove the amplitude noise in the RF signal.
Select the bandwidth filter from:
1.2288 (CDMA2K), 1.4, 3, 3.84 (WCDMA), 5, 10, 15, 20 MHz

Measurement window
Set the measurement window and offset with a proportional ratio (%) to the step length.
The setting range is 0% to 75% of the offset and 25% to 90% of the measurement window.
Set the offset and measurement interval so that the total is less than or equal to 100%.

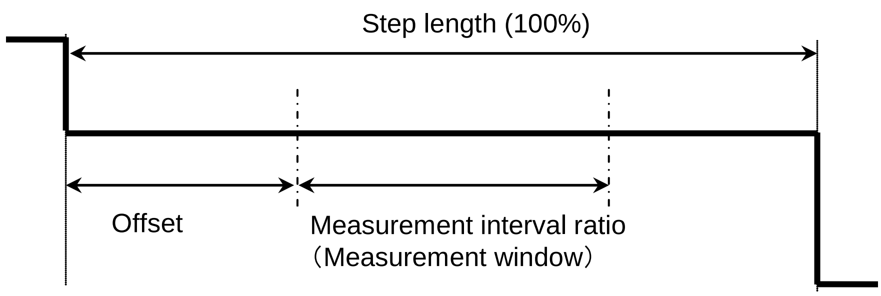


Figure 3.3.1-2 Measurement Window

Output level pattern
If the output level is changed at each step, set the pattern number a number between 0 and 1999.
If the output level is constant within the segment, select NORM. In this case, the output level is set to the value set in Section 3.2 “Setting Sequence Table”.

Output level pattern
Set the output level at each step. 2000 output level patterns are used and each pattern is allocated a number between 0 and 1999. Set the output levels in step order.

Table 3.3.1-1 Initial Values of Transmission Power Measurement Conditions

Setting	Value	Unit
Step length	20	ms
Step count	1	
Bandwidth	5	MHz
Offset	25	%
Measurement interval	55	%
Output level pattern	NORM	
Display method for invalid measurement result	OFF	

Table 3.3.1-2 Initial Values of Output Level Patterns

Pattern	Value	Unit
Level pattern 0	–120.0	dBm
Level pattern 1	–120.0	dBm
Level pattern 2	–120.0	dBm
Level pattern 3	–120.0	dBm

3.3.2 Tx Power commands

The following commands are used to set and query the Tx Power measurement.

- Step length
  TXPWR_STIME
  :CONFigure:CELLular:SEQuence:TXPower:STIMe
- Step count
  TXPWR_SCOUNT
  :CONFigure:CELLular:SEQuence:TXPower:SCOunt
- Bandwidth
  TXPWR_BW
  :CONFigure:CELLular:SEQuence:TXPower:FILter
- Offset, measurement interval
  TXPWR_MW
  :CONFigure:CELLular:SEQuence:TXPower:PERiod
- Output level pattern
  TXPWR_OLVL
  :CONFigure:CELLular:SEQuence:TXPower:OLEVel
- Output level per step
  TXPWR_OPAT0
  :CONFigure:CELLular:SEQuence:TXPower:OLPattern0
  TXPWR_OPAT1
  :CONFigure:CELLular:SEQuence:TXPower:OLPattern1
- Power measurement result
  TXPWR_PWR
  :FETCh:CELLular:SEQuence:TXPower:TXPower
- All power measurement result
  TXPWR_PWR_ALL
  :FETCh:CELLular:SEQuence:TXPower:TXPower:ALL

3.4 Controlling and Monitoring Sequence

3.4.1 Controlling and monitoring items

The following items can be set to control the sequence measurement.

- Start and stop segments
- Initialization after completion of sequence measurement

Start and stop segments

Segment numbers from 0 to 1999 can be set in the sequence table. The start and stop segments must be specified if part of a sequence table is executed. If start and stop segments are not specified, 0 to 199 (default) segments are measured.

Initialization after completion of sequence measurement

Select whether the following items are set to the values described in Section 2.1.3 “Frequency and level”, when sequence measurement is completed.

- Uplink frequency (Tx frequency of mobile station)
- Input level
- Downlink frequency (Rx frequency of mobile station)
- Output level

Use the commands described in Section 2.1.6 “Starting/stopping measurement” to verify the sequence measurement start, end and status. In addition, the following items can be queried.

- Number of measured segments
- Measurement status of each segment
- Measurement status of specified segments
- Progress of sequence measurement

Number of measured segments and measurement status of each segment

The number of completed segment measurements and the status of segments can be monitored during sequence measurement.
The following table lists the response values and status of segments.

Measurement status of specified segments

Monitor the status of segments by specifying segment numbers from 0 to 1999.

Table 3.4.1-1 Segment Status

Response	Status
0	Measurement completed successfully
2	Level over
9	Measuring or no measurement
10	Segment not to be measured
12	Timeout of Tx measurement*

*: Timeout trigger raises by transmission signal of UE.

Progress of sequence measurement

The progress can be measured as a proportion of the total number of segments between the start and stop numbers.

3.4.2 Sequence control and monitor commands

The sequence measurement can be controlled and monitored using the following commands.
The status indication lamp 3 of MU887000A is on during the execution of measurement or analysis.

- Start segment and stop segment for measurement and signal transmission
  This command sets both start segment and end segment for sequence measurement and sets both measurement and signal transmission parameters.
  `SEQCTRL`
  `:CONFigure:CELLular:SEQuence:CONTrol`
- Start segment and stop segment for measurement
  This command sets both start segment and end segment for sequence measurement and sets the measurement parameters only, without affecting the signal transmission parameters.
  `SEQCTRLTX`
  `:CONFigure:CELLular:SEQuence:CONTrol:TX`
- Initialization after completion of sequence measurement
  `SEQREINIT`
  `:CONFigure:CELLular:SEQuence:RFSettings:REINit`
- Number of measured segments and status of each segment
  `SEQMSTAT`
  `:FETCh:CELLular:SEQuence:STATe`
- Measurement status of specified segments
  `SEQSEGSTAT`
  `:FETCh:CELLular:SEQuence:SEG:STATe`

- Progress of sequence measurement
  `SEQPROGRESS`
  `:FETCh:CELLular:SEQuence:PROGress`
- Starting measurement and signal output
  This command sets the parameters for both specified measurement and signal transmission and executes measurement.
  `SNGLS`
  `:INITiate:CELLular:MEASurement:SINGle`
- Starting measurement
  This command sets only the parameters for the specified measurement and executes measurement, without affecting the signal transmission parameters.
  `SEQEXECTX`
  `:INITiate:CELLular:SEQuence:EXECute:TX`
- Stopping measurement
  `MEASSTOP`
  `:ABORt:CELLular:MEASurement`

3.5 Sample Program

This section describes an example of how to measure the average power of each segment for a signal with four sequences and 101 segments using the Native command mode.

Processing flow

1. Set the application software type to CELLULAR.
2. Set the measurement standard to MX887010A sequence measurement.
3. Set the measurement conditions in Tables 3.5-1 to 3.5-5.
4. Set output level pattern 1 from step 0 to step 49 so that the output level increments from –120 dBm in 1-dB steps.
5. Set the following items.

RF Signal output	On
Start segment number	0
Stop segment number	1
Initialization after sequence measurement	On

6. Query the sequence table for errors and abort if errors found.
7. Start measurement.
8. Query the status of measurements.
9. When measurement is completed, query:

   Power measurement result of segment 0
   Power measurement result of segment 1

Table 3.5-1 Sequence Table Setting 1

Segment number	Uplink frequency (MHz)	Input level (dBm)	Downlink frequency (MHz)	Output level (dBm)	Transmission signal pattern	Output port
1	1920	0	2110	–50	PAT1	1
2	1980	0	2170	–65	PAT4	2

Table 3.5-2 Sequence Table Setting 2

Segment number	Trigger source	Trigger slope*	Trigger level	Trigger delay time (ms)	Measurement item	Number of steps	Measurement condition number
1	Power	↑	–20	0	Transmission power	100	0
2	Power	↑	–35	0	Transmission power	60	1

*: ↑: Rise

Table 3.5-3 Transmission Power Measurement Condition Settings

Items	Settings			
Step length	10 ms			
Bandwidth (MHz)	5			
Offset (%)	20			
Measurement interval (%)	60			
Measurement condition number	0	1	2	…
Step count	100	200		
Output level pattern	PAT1	NORM		

```
; Sample program for Sequence Measurement
; Anritsu Corporation March,2012
; Macro for Tera Term Version 4.69
;
; set local echo to on
setecho 1
flushrecv
; time out 10 second
timeout=10

; Set language to "Native".
sendln 'SYST:LANG NAT'
call check_error_code

; Set VSG Mode to "Sequence".
sendln 'SOUR:GPRF:GEN:MODE SEQUENCE'
call check_error_code

; Set application software type to "CELLULAR".
sendln 'SYSSEL CELLULAR'
call check_error_code

; Set standard to "Sequence".
sendln 'STDSEL SEQUENCE'
call check_error_code

; Set Sequence Table Parameters of "segment 0".
sendln ' SEQTRX 0,1920,0,2110,-120,CW'
call check_error_code

sendln 'SEQSGPORT 0,PORT1'
call check_error_code

sendln 'SEQTRG 0,PWR,RISE,-20,0'
call check_error_code

sendln 'SEQMEAS 0,TXP,100,0'
call check_error_code

; Set Sequence Table Parameters of "segment 1".
sendln ' SEQTRX 1,1980,0,2170,-120,CW'
call check_error_code

sendln 'SEQSGPORT 1,PORT2'
```

```
call check_error_code

sendln 'SEQTRG 1,PWR,RISE,-35,0'
call check_error_code

sendln 'SEQMEAS 1,TXP,60,1'
call check_error_code

; Set Measurement Condition of "Tx Power".
sendln 'TXPWR_STIME 10'
call check_error_code

sendln 'TXPWR_BW 5MHZ'
call check_error_code

sendln 'TXPWR_MW 20,60'
call check_error_code

sendln 'TXPWR_SCOUNT 0,99'
call check_error_code

sendln 'TXPWR_SCOUNT 1,55'
call check_error_code

sendln 'TXPWR_OLVL 0,PAT1'
call check_error_code

sendln 'TXPWR_OLVL 1,NORM'
call check_error_code

; Set Output Levels (0 – 49) of "Output Level Pattern 1".
sendln 'TXPWR_OPAT0
  PAT1,-120,-119,-118,-117,-116,-115,-114,-113,-112,-111,-110,-109,-108,-10
  7,-106,-105,-104,-103,-102,-101,-100,-99,-98,-97,-96,-95,-94,-93,-92,-91,
  -90,-89,-88,-87,-86,-85,-84,-83,-82,-81,-80,-79,-78,-77,-76,-75,-74,-73,-
  72,-71'
call check_error_code

; Set Output State to "On".
sendln 'LVL ON'
call check_error_code

; Set Start Segment Number to "0",Stop Segment Number to "1".
sendln 'SEQCTRL 0,1'
```

```
call check_error_code

; Query error of Sequence table settings.
sendln 'SEQERR?'
  waitln '0,' '1,' '2,' '3,' '4,'
call check_seqerr_response

; Set Initialization to "On" when sequence finished.
sendln 'SEQREINIT ON'
call check_error_code

; Start measurement
sendln 'SNGLS'
call check_error_code

; waiting measurement up to 10 second
for i 1 10

  sendln 'MSTAT?'
  pause 1; wait 1 second
  recvln
  recvln
  ;call check_response  ; debug
  if result=0 goto _timeout
  if result=1 then
  str2int m_code inputstr
  if m_code=0 break     ;Sequence finish normally.
  call check_error_code
  endif

next

; Query Tx power data of "Segment 0".
sendln 'TXPWR_PWR? 0'
call check_error_code

; Query Tx power data of "Segment 1".
sendln 'TXPWR_PWR? 1'
call check_error_code

messagebox  'Macro end successfully' 'Finish'

End
```

```
;       ------------ subroutines -----------

:check_error_code
  ; query error
  sendln 'SYSERR?'
  waitln 'No error'

  ; in case of timeout
  if result=0 goto _timeout
  ; in case of error occurring
  if result=2 then
  e_message='Error code = '
  strconcat e_message inputstr
  messagebox  e_message 'Command Error occurred'
  end
  endif

  ; in case of no error

return

:check_seqerr_response

  ;for debug
  strsplit inputstr ','
  str2int err_num groupmatchstr1
  if err_num then
  ; when error count is not 0.
  messagebox inputstr 'Sequence Table Error'
  End
  endif

  return

:check_response

  ;for debug
  messagebox inputstr 'debug1'
  int2str result_str result
  messagebox result_str 'debug2'

  return
:_timeout
  messagebox  'No response from MT8870A.' 'Time out!'
```

```
call check_error_code
End
```

Chapter 4 SCPI Command Reference

This chapter describes the details of SCPI commands.
To switch to the SCPI command mode, send the command SYST:LANG SCPI.

4.1 List of Commands

The following table shows the rules for describing messages.

[ ]	Messages or parameters in square brackets can be omitted.
|	Choose one of several choices. A | B | C | D indicates a choice of A, B, C, and D.
{}	Choose one of the groups in braces. A | B({C | D}) indicates a choice of A, B(C), or A, B(D).

4.1.1 Common commands

Operation Status Register

Function	Command	Query	Response
Measurement Operation Status Register Query	-----	:STATus:OPERation:MEASure[:EVENt]?	<mosr>

Questionable Register

Function	Command	Query	Response
Measurement Questionable Status Register Query	-----	:STATus:QUEStionable:MEASure[:EVENt]?	<mqsr>

Common

Function	Command	Query	Response
Measurement Standard Select	:CONFigure:CELLular:MEASurement:STANdard <std>	:CONFigure:CELLular:MEASurement:STANdard?	<std>
Set Connect Port Direction	:ROUTe:PORT:CONNect:DIRection <input>,<output>	:ROUTe:PORT:CONNect:DIRection?	<input>,<output>

Measurement

Function	Command	Query	Response
Measurement Start	:INITiate:CELLular:MEASurement:SINGle	-----	-----
Measurement Stop	:ABORt:CELLular:MEASurement	-----	-----
Measurement Status	-----	:FETCh:CELLular:MEASurement:STATe?	<m_status>

Common Parameters

Function	Command	Query	Response
Output Level On/Off	:CONFigure:CELLular:GENerator:RFSettings:STATe <on_off>	:CONFigure:CELLular:GENerator:RFSettings:STATe?	<on_off>
Output Signal Modulation	:CONFigure:CELLular:GENerator:BBMode <on_off>	:CONFigure:CELLular:GENerator:BBMode?	<on_off>
Waveform File Select	:CONFigure:CELLular:GENerator:ARB:PACKage:SELect <pac>	:CONFigure:CELLular:GENerator:ARB:PACKage:SELect?	<pac>
Waveform Pattern Select	:CONFigure:CELLular:GENerator:ARB:WAVeform:PATTern:SELect <pat>	:CONFigure:CELLular:GENerator:ARB:WAVeform:PATTern:SELect?	<pat>
Waveform Pattern Select (SYNC)	:CONFigure:CELLular:GENerator:ARB:WAVeform:PATTern:SELect:SYNC <pat>	:CONFigure:CELLular:GENerator:ARB:WAVeform:PATTern:SELect:SYNC?	<pat>

System

Function	Command	Query	Response
Application Select	:INSTrument[:SELect]<app>	:INSTrument[:SELect]?	<app>
Language Selection of Remote Command	:SYSTem:LANGuage <mode>	:SYSTem:LANGuage?	<mode>

4.1.2 Fundamental measurement commands

Common Parameters

Function	Command	Query	Response
Uplink Frequency	:CONFigure:CELLular:MEASurement:RFSettings:FREQuency <ul_freq>	:CONFigure:CELLular:MEASurement:RFSettings:FREQuency?	<ul_freq>
Input Level	:CONFigure:CELLular:MEASurement:RFSettings:LEVel <level>	:CONFigure:CELLular:MEASurement:RFSettings:LEVel?	<level>
Downlink Frequency	:CONFigure:CELLular:GENerator:RFSettings:FREQuency <dl_freq>	:CONFigure:CELLular:GENerator:RFSettings:FREQuency?	<dl_freq>
Output Level	:CONFigure:CELLular:GENerator:RFSettings:LEVel <level>	:CONFigure:CELLular:GENerator:RFSettings:LEVel?	<level>
Measurement Select	:CONFigure:CELLular:MEASurement:SELect <meassel>	:CONFigure:CELLular:MEASurement:SELect?	<meassel>

Spectrum Monitor Parameters

Function	Command	Query	Response
Spectrum Monitor - Detect Mode	:CONFigure:CELLular:COMMon:SPMonitor:DETect <mode>	:CONFigure:CELLular:COMMon:SPMonitor:DETect?	<mode>
Spectrum Monitor - Power Measurement Bandwidth	:CONFigure:CELLular:COMMon:SPMonitor:PMBW <width>	:CONFigure:CELLular:COMMon:SPMonitor:PMBW?	<width>
Spectrum Monitor - Resolution Bandwidth	:CONFigure:CELLular:COMMon:SPMonitor:RBW <bandwidth>	:CONFigure:CELLular:COMMon:SPMonitor:RBW?	<bandwidth>
Spectrum Monitor - Span	:CONFigure:CELLular:COMMon:SPMonitor:SPAN <span>	:CONFigure:CELLular:COMMon:SPMonitor:SPAN?	<span>
Spectrum Monitor - Storage Count	:CONFigure:CELLular:COMMon:SPMonitor:STORage:COUNt <count>	:CONFigure:CELLular:COMMon:SPMonitor:STORage:COUNt?	<count>
Spectrum Monitor - Storage Mode	:CONFigure:CELLular:COMMon:SPMonitor:STORage:MODE <mode>	:CONFigure:CELLular:COMMon:SPMonitor:STORage:MODE?	<mode>
Spectrum Monitor - Analysis Time	:CONFigure:CELLular:COMMon:SPMonitor:TIME<anlylen>	:CONFigure:CELLular:COMMon:SPMonitor:TIME?	<anlylen>
Spectrum Monitor - Trigger Delay	:TRIGger:CELLular:COMMon:SPMonitor:DELay <time>	:TRIGger:CELLular:COMMon:SPMonitor:DELay?	<time>
Spectrum Monitor - Trigger Timeout	:TRIGger:CELLular:COMMon:SPMonitor:TOUT <time>	:TRIGger:CELLular:COMMon:SPMonitor:TOUT?	<time>
Spectrum Monitor - Trigger Source	:TRIGger:CELLular:COMMon:SPMonitor:SOURce <source>	:TRIGger:CELLular:COMMon:SPMonitor:SOURce?	<source>

Spectrum Monitor Results

Function	Command	Query	Response
Spectrum Monitor - Power	-----	:FETCh:CELLular:COMMon:SPMonitor:POWer?	<power>
Spectrum Monitor - Data	-----	:FETCh:CELLular:COMMon:SPMonitor:TRACe:DATA? <format>,<position>,<length>	<data(i)>
Spectrum Monitor - Trace Point	-----	:FETCh:CELLular:COMMon:SPMonitor:TRACe:POINt?	<point>

Multiple Power Parameters

Function	Command	Query	Response
Multiple Power Measurement - Filter	:CONFigure:CELLular:COMMon:MULTipower:FILTer <filter>	:CONFigure:CELLular:COMMon:MULTipower:FILTer?	<filter>
Multiple Power Measurement - Invalid Result Output	:CONFigure:CELLular:COMMon:MULTipower:IROutput <on_off>	:CONFigure:CELLular:COMMon:MULTipower:IROutput?	<on_off>
Multiple Power Measurement - Measurement Window Offset & Measurement Window	:CONFigure:CELLular:COMMon:MULTipower:PERiod <offset>,<meas_window>	:CONFigure:CELLular:COMMon:MULTipower:PERiod?	<offset>,<meas_window>
Multiple Power Measurement - Number of Steps	:CONFigure:CELLular:COMMon:MULTipower:STEP:NUM <numstep>	:CONFigure:CELLular:COMMon:MULTipower:STEP:NUM?	<numstep>
Multiple Power Measurement - Power Step Time	:CONFigure:CELLular:COMMon:MULTipower:STEP:TIME <steptime>	:CONFigure:CELLular:COMMon:MULTipower:STEP:TIME?	<data>
Multiple Power Measurement - Input Level Control	:CONFigure:CELLular:COMMon:MULTipower:TXRef <s>[,ref(0)[,<n(1)>,<ref(1)>[,…[,<n(i)> ,<ref(i)>],…]]	:CONFigure:CELLular:COMMon:MULTipower:TXRef?	<s>,<ref(0)>,<n(1)>,<ref(1)>,<n(2)>,<ref(2)>,…

Multiple Power Parameters (Cont'd)

Function	Command	Query	Response
Multiple Power Measurement - Trigger Level	:TRIGger:CELLular:COMMon:MULTipower:THReshold <level>	:TRIGger:CELLular:COMMon:MULTipower:THReshold?	<level>
Multiple Power Measurement - Trigger Timeout	:TRIGger:CELLular:COMMon:MULTipower:TOUT <timeout>	:TRIGger:CELLular:COMMon:MULTipower:TOUT?	<timeout>

Multiple Power Result

Function	Command	Query	Response
Multiple Power Measurement - Level	-----	:FETCh:CELLular:COMMon:MULTipower:MRFPower? [<pos>[,<num>]]	<l(i)>

Narrowband Parameters

Function	Command	Query	Response
Narrowband Power vs Time - Measurement Window Offset and Measurement Window	:CONFigure:CELLular:COMMon:NARRowband:PERiod <offset>,<meas_window>	:CONFigure:CELLular:COMMon:NARRowband:PERiod?	<offset>,<meas_window>
Narrowband Power vs Time - Segment Duration and Number of Segments	:CONFigure:CELLular:COMMon:NARRowband:SEGMent <duration>,<num>	:CONFigure:CELLular:COMMon:NARRowband:SEGMent?	<duration>,<num>
Narrowband Power vs Time - Trigger Timeout	:TRIGger:CELLular:COMMon:NARRowband:TOUT <timeout>	:TRIGger:CELLular:COMMon:NARRowband:TOUT?	<timeout>

Narrowband Result

Function	Command	Query	Response
Narrowband Power vs Time - Measurement Result	-----	:FETCh:CELLular:COMMon:NARRowband:POWer?	<p(i)>

Tx/Rx vs Frequency Measurements

Function	Command	Query	Response
Tx/Rx vs. Frequency Measurement - Filter	:CONFigure:CELLular:COMMon:TRXFrequency:FILTer <filter>	:CONFigure:CELLular:COMMon:TRXFrequency:FILTer?	<filter>
Tx/Rx vs. Frequency Measurement - Registration of Tx/Rx Frequency	:CONFigure:CELLular:COMMon:TRXFrequency:FREQuency <dlfreq(0)>,<ulfreq(0)>[,<dlfreq(1)>,<ulfreq(1)>[,…[,<dlfreq(399)>,<ulfreq(399)>]…]	:CONFigure:CELLular:COMMon:TRXFrequency:FREQuency?	<dlfreq(0)>,<ulfreq(0)>,<dlfreq(1)>,<ulfreq(1)>,…,<dlfreq(399)>,<ulfreq(399)>
	:CONFigure:CELLular:COMMon:TRXFrequency:FREQuency2 <dlfreq(10)>,<ulfreq(10)>[,<dlfreq(11)>,<ulfreq(11)>[,…[,<dlfreq(19)>,<ulfreq(19)>]…]	:CONFigure:CELLular:COMMon:TRXFrequency:FREQuency2?	<dlfreq(10)>,<ulfreq(10)>,<dlfreq(11)>,<ulfreq(11)>,…,<dlfreq(19)>,<ulfreq(19)>
	:CONFigure:CELLular:COMMon:TRXFrequency:FREQuency3 <dlfreq(20)>,<ulfreq(20)>[,<dlfreq(21)>,<ulfreq(21)>[,…[,<dlfreq(29)>,<ulfreq(29)>]…]	:CONFigure:CELLular:COMMon:TRXFrequency:FREQuency3?	<dlfreq(20)>,<ulfreq(20)>,<dlfreq(21)>,<ulfreq(21)>,…,<dlfreq(29)>,<ulfreq(29)>
	:CONFigure:CELLular:COMMon:TRXFrequency:FREQuency4 <dlfreq(30)>,<ulfreq(30)>[,<dlfreq(31)>,<ulfreq(31)>[,…[<dlfreq(39)>,<ulfreq(39)>]…]	:CONFigure:CELLular:COMMon:TRXFrequency:FREQuency4?	<dlfreq(30)>,<ulfreq(30)>,<dlfreq(31)>,<ulfreq(31)>,…,<dlfreq(39)>,<ulfreq(39)>

Tx/Rx vs Frequency Measurements (Cont’d)

Function	Command	Query	Response
Tx/Rx vs. Frequency Measurement - Registration of Tx/Rx Frequency	:CONFigure:CELLular:COMMon:TRXFrequency:FREQuency5 <dlfreq(40)>,<ulfreq(40)>[,<dlfreq(41)>,<ulfreq(41)>[,…[,<dlfreq(49)>,<ulfreq(49)>]…]	:CONFigure:CELLular:COMMon:TRXFrequency:FREQuency5?	<dlfreq(40)>,<ulfreq(40)>,<dlfreq(41)>,<ulfreq(41)>,…,<dlfreq(49)>,<ulfreq(49)>
	:CONFigure:CELLular:COMMon:TRXFrequency:FREQuency6 <dlfreq(50)>,<ulfreq(50)>[,<dlfreq(51)>,<ulfreq(51)>[,…[,<dlfreq(59)>,<ulfreq(59>)…]	:CONFigure:CELLular:COMMon:TRXFrequency:FREQuency6?	<dlfreq(50)>,<ulfreq(50)>,<dlfreq(51)>,<ulfreq(51)>,…,<dlfreq(59)>,<ulfreq(59)>
	:CONFigure:CELLular:COMMon:TRXFrequency:FREQuency7 <dlfreq(60)>,<ulfreq(60)>[,<dlfreq(61)>,<ulfreq(61)>[,…[,<dlfreq(69)>,<ulfreq(69)>]…]	:CONFigure:CELLular:COMMon:TRXFrequency:FREQuency7?	<dlfreq(60)>,<ulfreq(60)>,<dlfreq(61)>,<ulfreq(61)>,…,<dlfreq(69)>,<ulfreq(69)>
	:CONFigure:CELLular:COMMon:TRXFrequency:FREQuency8 <dlfreq(70)>,<ulfreq(70)>[,<dlfreq(71)>,<ulfreq(71)>[,…[,<dlfreq(79)>,<ulfreq(79)>]…]	:CONFigure:CELLular:COMMon:TRXFrequency:FREQuency8?	<dlfreq(70)>,<ulfreq(70)>,<dlfreq(71)>,<ulfreq(71)>,…,<dlfreq(79)>,<ulfreq(79)>

Tx/Rx vs. Frequency Measurement (Cont'd)

Function	Command	Query	Response
Tx/Rx vs. Frequency Measurement - Registration of Tx/Rx Frequency	:CONFigure:CELLular:COMMon:TRXFrequency:FREQuency9 <dlfreq(80)>,<ulfreq(80)>[,<dlfreq(81)>,<ulfreq(81)>[,…[,<dlfreq(89)>,<ulfreq(89)>]…]	:CONFigure:CELLular:COMMon:TRXFrequency:FREQuency9?	<dlfreq(80)>,<ulfreq(80)>,<dlfreq(81)>,<ulfreq(81)>,…,<dlfreq(89)>,<ulfreq(89)>
	:CONFigure:CELLular:COMMon:TRXFrequency:FREQuency10 <dlfreq(90)>,<ulfreq(90)>[,<dlfreq(91)>,<ulfreq(91)>[,…[,<dlfreq(99)>,<ulfreq(99)>]…]	:CONFigure:CELLular:COMMon:TRXFrequency:FREQuency10?	<dlfreq(90)>,<ulfreq(90)>,<dlfreq(91)>,<ulfreq(91)>,…,<dlfreq(99)>,<ulfreq(99)>
	:CONFigure:CELLular:COMMon:TRXFrequency:FREQuency11 <dlfreq(100)>,<ulfreq(100)>[,<dlfreq(101)>,<ulfreq(101)>[,…[,<dlfreq(109)>,<ulfreq(109)>]…]	:CONFigure:CELLular:COMMon:TRXFrequency:FREQuency11?	<dlfreq(100)>,<ulfreq(100)>,<dlfreq(101)>,<ulfreq(101)>,…,<dlfreq(109)>,<ulfreq(109)>
	:CONFigure:CELLular:COMMon:TRXFrequency:FREQuency12 <dlfreq(110)>,<ulfreq(110)>[,<dlfreq(111)>,<ulfreq(111)>[,…[,<dlfreq(119)>,<ulfreq(119)>]…]	:CONFigure:CELLular:COMMon:TRXFrequency:FREQuency12?	<dlfreq(110)>,<ulfreq(110)>,<dlfreq(111)>,<ulfreq(111)>,…,<dlfreq(119)>,<ulfreq(119)>

Tx/Rx vs. Frequency Measurement (Cont’d)

Function	Command	Query	Response
Tx/Rx vs. Frequency Measurement - Registration of Tx/Rx Frequency	:CONFigure:CELLular:COMMon:TRXFrequency:FREQuency13 <dlfreq(120)>,<ulfreq(120)>[,<dlfreq(121)>,<ulfreq(121)>[,…[,<dlfreq(129)>, <ulfreq(129)>]…]	:CONFigure:CELLular:COMMon:TRXFrequency:FREQuency13?	<dlfreq(120)>,<ulfreq(120)>,<dlfreq(121)>,<ulfreq(121)>,…,<dlfreq(129)>,<ulfreq(129)>
	:CONFigure:CELLular:COMMon:TRXFrequency:FREQuency14 <dlfreq(130)>,<ulfreq(130)>[,<dlfreq(131)>,<ulfreq(131)>[,…[,<dlfreq(139)>, <ulfreq(139>)…]	:CONFigure:CELLular:COMMon:TRXFrequency:FREQuency14?	<dlfreq(130)>,<ulfreq(130)>,<dlfreq(131)>,<ulfreq(131)>,…,<dlfreq(139)>,<ulfreq(139)>
	:CONFigure:CELLular:COMMon:TRXFrequency:FREQuency15 <dlfreq(140)>,<ulfreq(140)>[,<dlfreq(141)>,<ulfreq(141)>[,…[,<dlfreq(149)>, <ulfreq(149)>]…]	:CONFigure:CELLular:COMMon:TRXFrequency:FREQuency15?	<dlfreq(140)>,<ulfreq(140)>,<dlfreq(141)>,<ulfreq(141)>,…,<dlfreq(149)>,<ulfreq(149)>
	:CONFigure:CELLular:COMMon:TRXFrequency:FREQuency16 <dlfreq(150)>,<ulfreq(150)>[,<dlfreq(151)>,<ulfreq(151)>[,…[,<dlfreq(159)>, <ulfreq(159)>]…]	:CONFigure:CELLular:COMMon:TRXFrequency:FREQuency16?	<dlfreq(150)>,<ulfreq(150)>,<dlfreq(151)>,<ulfreq(151)>,…,<dlfreq(159)>,<ulfreq(159)>

Tx/Rx vs. Frequency Measurement (Cont'd)

Function	Command	Query	Response
Tx/Rx vs. Frequency Measurement - Registration of Tx/Rx Frequency	:CONFigure:CELLular:COMMon:TRXFrequency:FREQuency17 <dlfreq(160)>,<ulfreq(160)>[,<dlfreq(161)>,<ulfreq(161)>[,…[,<dlfreq(169)>,<ulfreq(169)>]…]	:CONFigure:CELLular:COMMon:TRXFrequency:FREQuency17?	<dlfreq(160)>,<ulfreq(160)>,<dlfreq(161)>,<ulfreq(161)>,…,<dlfreq(169)>,<ulfreq(169)>
	:CONFigure:CELLular:COMMon:TRXFrequency:FREQuency18 <dlfreq(170)>,<ulfreq(170)>[,<dlfreq(171)>,<ulfreq(171)>[,…[,<dlfreq(179)>,<ulfreq(179>)…]	:CONFigure:CELLular:COMMon:TRXFrequency:FREQuency18?	<dlfreq(170)>,<ulfreq(170)>,<dlfreq(171)>,<ulfreq(171)>,…,<dlfreq(179)>,<ulfreq(179)>
	:CONFigure:CELLular:COMMon:TRXFrequency:FREQuency19 <dlfreq(180)>,<ulfreq(180)>[,<dlfreq(181)>,<ulfreq(181)>[,…[,<dlfreq(189)>,<ulfreq(189)>]…]	:CONFigure:CELLular:COMMon:TRXFrequency:FREQuency19?	<dlfreq(180)>,<ulfreq(180)>,<dlfreq(181)>,<ulfreq(181)>,…,<dlfreq(189)>,<ulfreq(189)>
	:CONFigure:CELLular:COMMon:TRXFrequency:FREQuency20 <dlfreq(190)>,<ulfreq(190)>[,<dlfreq(191)>,<ulfreq(191)>[,…[,<dlfreq(199)>,<ulfreq(199)>]…]	:CONFigure:CELLular:COMMon:TRXFrequency:FREQuency20?	<dlfreq(190)>,<ulfreq(190)>,<dlfreq(191)>,<ulfreq(191)>,…,<dlfreq(199)>,<ulfreq(199)>

Tx/Rx vs. Frequency Measurement (Cont’d)

Function	Command	Query	Response
Tx/Rx vs. Frequency Measurement - Registration of Tx/Rx Frequency	:CONFigure:CELLular:COMMon:TRXFrequency:FREQuency21 <dlfreq(200)>,<ulfreq(200)>[,<dlfreq(201)>,<ulfreq(201)>[,…[,<dlfreq(209)>,<ulfreq(209)>]…]	:CONFigure:CELLular:COMMon:TRXFrequency:FREQuency21?	<dlfreq(200)>,<ulfreq(200)>,<dlfreq(201)>,<ulfreq(201)>,…,<dlfreq(209)>,<ulfreq(209)>
	:CONFigure:CELLular:COMMon:TRXFrequency:FREQuency22 <dlfreq(210)>,<ulfreq(210)>[,<dlfreq(211)>,<ulfreq(211)>[,…[,<dlfreq(219)>,<ulfreq(219>)…]	:CONFigure:CELLular:COMMon:TRXFrequency:FREQuency22?	<dlfreq(210)>,<ulfreq(210)>,<dlfreq(211)>,<ulfreq(211)>,…,<dlfreq(219)>,<ulfreq(219)>
	:CONFigure:CELLular:COMMon:TRXFrequency:FREQuency23 <dlfreq(220)>,<ulfreq(220)>[,<dlfreq(221)>,<ulfreq(221)>[,…[,<dlfreq(229)>,<ulfreq(229)>]…]	:CONFigure:CELLular:COMMon:TRXFrequency:FREQuency23?	<dlfreq(220)>,<ulfreq(220)>,<dlfreq(221)>,<ulfreq(221)>,…,<dlfreq(229)>,<ulfreq(229)>
	:CONFigure:CELLular:COMMon:TRXFrequency:FREQuency24 <dlfreq(230)>,<ulfreq(230)>[,<dlfreq(231)>,<ulfreq(231)>[,…[,<dlfreq(239)>,<ulfreq(239)>]…]	:CONFigure:CELLular:COMMon:TRXFrequency:FREQuency24?	<dlfreq(230)>,<ulfreq(230)>,<dlfreq(231)>,<ulfreq(231)>,…,<dlfreq(239)>,<ulfreq(239)>

Tx/Rx vs. Frequency Measurement (Cont'd)

Function	Command	Query	Response
Tx/Rx vs. Frequency Measurement - Registration of Tx/Rx Frequency	:CONFigure:CELLular:COMMon:TRXFrequency:FREQuency25 <dlfreq(240)>,<ulfreq(240)>[,<dlfreq(241)>,<ulfreq(241)>[,…[,<dlfreq(249)>,<ulfreq(249)>]…]	:CONFigure:CELLular:COMMon:TRXFrequency:FREQuency25?	<dlfreq(240)>,<ulfreq(240)>,<dlfreq(241)>,<ulfreq(241)>,…,<dlfreq(249)>,<ulfreq(249)>
	:CONFigure:CELLular:COMMon:TRXFrequency:FREQuency26 <dlfreq(250)>,<ulfreq(250)>[,<dlfreq(251)>,<ulfreq(251)>[,…[,<dlfreq(259)>,<ulfreq(259>)…]	:CONFigure:CELLular:COMMon:TRXFrequency:FREQuency26?	<dlfreq(250)>,<ulfreq(250)>,<dlfreq(251)>,<ulfreq(251)>,…,<dlfreq(259)>,<ulfreq(259)>
	:CONFigure:CELLular:COMMon:TRXFrequency:FREQuency27 <dlfreq(260)>,<ulfreq(260)>[,<dlfreq(261)>,<ulfreq(261)>[,…[,<dlfreq(269)>,<ulfreq(269)>]…]	:CONFigure:CELLular:COMMon:TRXFrequency:FREQuency27?	<dlfreq(260)>,<ulfreq(260)>,<dlfreq(261)>,<ulfreq(261)>,…,<dlfreq(269)>,<ulfreq(269)>
	:CONFigure:CELLular:COMMon:TRXFrequency:FREQuency28 <dlfreq(270)>,<ulfreq(270)>[,<dlfreq(271)>,<ulfreq(271)>[,…[,<dlfreq(279)>,<ulfreq(279)>]…]	:CONFigure:CELLular:COMMon:TRXFrequency:FREQuency28?	<dlfreq(270)>,<ulfreq(270)>,<dlfreq(271)>,<ulfreq(271)>,…,<dlfreq(279)>,<ulfreq(279)>

Tx/Rx vs. Frequency Measurement (Cont'd)

Function	Command	Query	Response
Tx/Rx vs. Frequency Measurement - Registration of Tx/Rx Frequency	:CONFigure:CELLular:COMMon:TRXFrequency:FREQuency29 <dlfreq(280)>,<ulfreq(280)>[,<dlfreq(281)>,<ulfreq(281)>[,…[,<dlfreq(289)>,<ulfreq(289)>]…]	:CONFigure:CELLular:COMMon:TRXFrequency:FREQuency29?	<dlfreq(280)>,<ulfreq(280)>,<dlfreq(281)>,<ulfreq(281)>,…,<dlfreq(289)>,<ulfreq(289)>
	:CONFigure:CELLular:COMMon:TRXFrequency:FREQuency30 <dlfreq(290)>,<ulfreq(290)>[,<dlfreq(291)>,<ulfreq(291)>[,…[,<dlfreq(299)>,<ulfreq(299>)…]	:CONFigure:CELLular:COMMon:TRXFrequency:FREQuency30?	<dlfreq(290)>,<ulfreq(290)>,<dlfreq(291)>,<ulfreq(291)>,…,<dlfreq(299)>,<ulfreq(299)>
	:CONFigure:CELLular:COMMon:TRXFrequency:FREQuency31 <dlfreq(300)>,<ulfreq(300)>[,<dlfreq(301)>,<ulfreq(301)>[,…[,<dlfreq(309)>,<ulfreq(309)>]…]	:CONFigure:CELLular:COMMon:TRXFrequency:FREQuency31?	<dlfreq(300)>,<ulfreq(300)>,<dlfreq(301)>,<ulfreq(301)>,…,<dlfreq(309)>,<ulfreq(309)>
	:CONFigure:CELLular:COMMon:TRXFrequency:FREQuency32 <dlfreq(310)>,<ulfreq(310)>[,<dlfreq(311)>,<ulfreq(311)>[,…[,<dlfreq(319)>,<ulfreq(319)>]…]	:CONFigure:CELLular:COMMon:TRXFrequency:FREQuency32?	<dlfreq(310)>,<ulfreq(310)>,<dlfreq(311)>,<ulfreq(311)>,…,<dlfreq(319)>,<ulfreq(319)>

Tx/Rx vs. Frequency Measurement (Cont’d)

Function	Command	Query	Response
Tx/Rx vs. Frequency Measurement - Registration of Tx/Rx Frequency	:CONFigure:CELLular:COMMon:TRXFrequency:FREQuency33 <dlfreq(320)>,<ulfreq(320)>[,<dlfreq(321)>,<ulfreq(321)>[,…[,<dlfreq(329)>,<ulfreq(329)>]…]	:CONFigure:CELLular:COMMon:TRXFrequency:FREQuency33?	<dlfreq(320)>,<ulfreq(320)>,<dlfreq(321)>,<ulfreq(321)>,…,<dlfreq(329)>,<ulfreq(329)>
	:CONFigure:CELLular:COMMon:TRXFrequency:FREQuency34 <dlfreq(330)>,<ulfreq(330)>[,<dlfreq(331)>,<ulfreq(331)>[,…[,<dlfreq(339)>,<ulfreq(339>)…]	:CONFigure:CELLular:COMMon:TRXFrequency:FREQuency34?	<dlfreq(330)>,<ulfreq(330)>,<dlfreq(331)>,<ulfreq(331)>,…,<dlfreq(339)>,<ulfreq(339)>
	:CONFigure:CELLular:COMMon:TRXFrequency:FREQuency35 <dlfreq(340)>,<ulfreq(340)>[,<dlfreq(341)>,<ulfreq(341)>[,…[,<dlfreq(349)>,<ulfreq(349)>]…]	:CONFigure:CELLular:COMMon:TRXFrequency:FREQuency35?	<dlfreq(340)>,<ulfreq(340)>,<dlfreq(341)>,<ulfreq(341)>,…,<dlfreq(349)>,<ulfreq(349)>
	:CONFigure:CELLular:COMMon:TRXFrequency:FREQuency36 <dlfreq(350)>,<ulfreq(350)>[,<dlfreq(351)>,<ulfreq(351)>[,…[,<dlfreq(359)>,<ulfreq(359)>]…]	:CONFigure:CELLular:COMMon:TRXFrequency:FREQuency36?	<dlfreq(350)>,<ulfreq(350)>,<dlfreq(351)>,<ulfreq(351)>,…,<dlfreq(359)>,<ulfreq(359)>

Tx/Rx vs. Frequency Measurement (Cont'd)

Function	Command	Query	Response
Tx/Rx vs. Frequency Measurement - Registration of Tx/Rx Frequency	:CONFigure:CELLular:COMMon:TRXFrequency:FREQuency37 <dlfreq(360)>,<ulfreq(360)>[,<dlfreq(361)>,<ulfreq(361)>[,…[,<dlfreq(369)>,<ulfreq(369)>]…]	:CONFigure:CELLular:COMMon:TRXFrequency:FREQuency37?	<dlfreq(360)>,<ulfreq(360)>,<dlfreq(361)>,<ulfreq(361)>,…,<dlfreq(369)>,<ulfreq(369)>
	:CONFigure:CELLular:COMMon:TRXFrequency:FREQuency38 <dlfreq(370)>,<ulfreq(370)>[,<dlfreq(371)>,<ulfreq(371)>[,…[,<dlfreq(379)>,<ulfreq(379>)…]	:CONFigure:CELLular:COMMon:TRXFrequency:FREQuency38?	<dlfreq(370)>,<ulfreq(370)>,<dlfreq(371)>,<ulfreq(371)>,…,<dlfreq(379)>,<ulfreq(379)>
	:CONFigure:CELLular:COMMon:TRXFrequency:FREQuency39 <dlfreq(380)>,<ulfreq(380)>[,<dlfreq(381)>,<ulfreq(381)>[,…[,<dlfreq(389)>,<ulfreq(389)>]…]	:CONFigure:CELLular:COMMon:TRXFrequency:FREQuency39?	<dlfreq(380)>,<ulfreq(380)>,<dlfreq(381)>,<ulfreq(381)>,…,<dlfreq(389)>,<ulfreq(389)>
	:CONFigure:CELLular:COMMon:TRXFrequency:FREQuency40 <dlfreq(390)>,<ulfreq(390)>[,<dlfreq(391)>,<ulfreq(391)>[,…[,<dlfreq(399)>,<ulfreq(399)>]…]	:CONFigure:CELLular:COMMon:TRXFrequency:FREQuency40?	<dlfreq(390)>,<ulfreq(390)>,<dlfreq(391)>,<ulfreq(391)>,…,<dlfreq(399)>,<ulfreq(399)>

Tx/Rx vs Frequency Measurements (Cont'd)

Function	Command	Query	Response
Tx/Rx vs. Frequency Measurement - Invalid Result Output	:CONFigure:CELLular:COMMon:TRXFrequency:IROutput <on_off>	:CONFigure:CELLular:COMMon:TRXFrequency:IROutput?	<on_off>
Tx/Rx vs. Frequency Measurement - Measurement Window Offset & Measurement Window	:CONFigure:CELLular:COMMon:TRXFrequency:PERiod <offset>,<meas_window>	:CONFigure:CELLular:COMMon:TRXFrequency:PERiod?	<offset>,<meas_window>
Tx/Rx vs. Frequency Measurement - Registration of Mobile Rx Power	:CONFigure:CELLular:COMMon:TRXFrequency:RXLevel <p(n)>	:CONFigure:CELLular:COMMon:TRXFrequency:RXLevel?	<p(n)>
Tx/Rx vs. Frequency Measurement - Registration of Mobile Rx Power	:CONFigure:CELLular:COMMon:TRXFrequency:RXLevel2 <p(n)>	:CONFigure:CELLular:COMMon:TRXFrequency:RXLevel2?	<p(n)>
Tx/Rx vs. Frequency Measurement - Segment Duration	:CONFigure:CELLular:COMMon:TRXFrequency:SEGMent:DURation <duration>	:CONFigure:CELLular:COMMon:TRXFrequency:SEGMent:DURation?	<duration>
Tx/Rx vs. Frequency Measurement - Segment Number	:CONFigure:CELLular:COMMon:TRXFrequency:SEGMent:NUMBer <seg>	:CONFigure:CELLular:COMMon:TRXFrequency:SEGMent:NUMBer?	<seg>
Tx/Rx vs. Frequency Measurement - Sequence Number	:CONFigure:CELLular:COMMon:TRXFrequency:SEQuence:NUMBer <seq>	:CONFigure:CELLular:COMMon:TRXFrequency:SEQuence:NUMBer?	<seq>
Tx/Rx vs. Frequency Measurement - Input Level Control	:CONFigure:CELLular:COMMon:TRXFrequency:TXRef <s>[,<ref(0)>[,<n(1)>,<ref(1)>[,…[,<n(99)>,<ref(99)>]…]]]	:CONFigure:CELLular:COMMon:TRXFrequency:TXRef?	<s>,<ref(0)>,<n(1)>,<ref(1)>,…,<n(99)>,<ref(99)>
Tx/Rx vs. Frequency Measurement - Trigger Level	:TRIGger:CELLular:COMMon:TRXFrequency:THReshold <level>	:TRIGger:CELLular:COMMon:TRXFrequency:THReshold?	<level>
Tx/Rx vs. Frequency Measurement - Trigger Timeout	:TRIGger:CELLular:COMMon:TRXFrequency:TOUT <timeout>	:TRIGger:CELLular:COMMon:TRXFrequency:TOUT?	<timeout>

Tx/Rx vs Frequency Measurements (Cont'd)

Function	Command	Query	Response
Tx/Rx vs. Frequency Measurement - Trigger Delay	:TRIGger:CELLular:COMMon:TRXFrequency:DELay	:TRIGger:CELLular:COMMon:TRXFrequency:DELay?	<delay>

Tx/Rx vs Frequency Measurement Results

Function	Command	Query	Response
Tx/Rx vs. Frequency Measurement - Level	-----	:FETCh:CELLular:COMMon:TRXFrequency:LEVel?	<l(i)>
Tx/Rx vs. Frequency Measurement - Valid Number of Sequences and Segments	-----	:FETCh:CELLular:COMMon:TRXFrequency:LEVel:NUMBer?	<n>,<seg>,<seq>

IQ Capture Parameter

Function	Command	Query	Response
IQ Capture - Measurement Bandwidth	:CONFigure:CELLular:COMMon:IQCapture:FILTer <bw>	:CONFigure:CELLular:COMMon:IQCapture:FILTer?	<bw>
IQ Capture - Time Span	:CONFigure:CELLular:COMMon:IQCapture:TSPan <tspan>	:CONFigure:CELLular:COMMon:IQCapture:TSPan?	<tspan>
IQ Capture - Trigger Delay	:TRIGger:CELLular:COMMon:IQCapture:DELay <delay>	:TRIGger:CELLular:COMMon:IQCapture:DELay?	<delay>
IQ Capture - Trigger Level	:TRIGger:CELLular:COMMon:IQCapture:THReshold <level>	:TRIGger:CELLular:COMMon:IQCapture:THReshold?	<level>
IQ Capture - Trigger Timeout	:TRIGger:CELLular:COMMon:IQCapture:TOUT <time>	:TRIGger:CELLular:COMMon:IQCapture:TOUT?	<time>

IQ Capture Result

Function	Command	Query	Response
IQ Capture - IQ Data	-----	:FETCh:CELLular:COMMon:IQCapture:IQData? <type>,<start>,<num>	XY<Y byte binary data><terminator>
IQ Capture - Number of Samples	-----	:FETCh:CELLular:COMMon:IQCapture:SAMPles?	<sample>
IQ Capture - Sampling Rate	-----	:FETCh:CELLular:COMMon:IQCapture:SRATe?	<rate>

4.1.3 Sequence measurement commands

Common Parameters

Function	Command	Query	Response
Uplink Frequency	:CONFigure:CELLular:MEASurement:RFSettings:FREQuency <ul_freq>	:CONFigure:CELLular:MEASurement:RFSettings:FREQuency?	<ul_freq>
Input Level	:CONFigure:CELLular:MEASurement:RFSettings:LEVel <level>	:CONFigure:CELLular:MEASurement:RFSettings:LEVel?	<level>
Downlink Frequency	:CONFigure:CELLular:GENerator:RFSettings:FREQuency <dl_freq>	:CONFigure:CELLular:GENerator:RFSettings:FREQuency?	<dl_freq>
Output Level	:CONFigure:CELLular:GENerator:RFSettings:LEVel <level>	:CONFigure:CELLular:GENerator:RFSettings:LEVel?	<level>

Sequence Control Parameters

Function	Command	Query	Response
Sequence Control Parameter - Sequence Control	:CONFigure:CELLular:SEQuence:CONTrol <start>,<end>	:CONFigure:CELLular:SEQuence:CONTrol?	<start>,<end>
Sequence Control Parameter - Sequence Control	:CONFigure:CELLular:SEQuence:CONTrol:TX <start>,<end>	:CONFigure:CELLular:SEQuence:CONTrol:TX?	<start>,<end>
Sequence Control Parameter - Sequence End State Reinitialization	:CONFigure:CELLular:SEQuence:RFSettings:REINit <sw>	:CONFigure:CELLular:SEQuence:RFSettings:REINit?	<sw>
Sequence Control Parameter - Sequence Table	:CONFigure:CELLular:SEQuence:TABLe <table>	:CONFigure:CELLular:SEQuence:TABLe?	<table>
Start Signal Analyzer Measurement Only	:INITiate:CELLular:SEQuence:EXECute:TX	-----	-----

Sequence Measurements

Function	Command	Query	Response
Sequence Progress	-----	:FETCh:CELLular:SEQuence:PROGress?	<p>,<cur>,<start>,<stop>
Specified Segment Status	-----	:FETCh:CELLular:SEQuence:SEG:STATe? <seg>	<stat>
Sequence Measurement Status	-----	:FETCh:CELLular:SEQuence:STATe?	<m_status>,<n>,<s(n-1)>
Trigger Timeout	:TRIGger:CELLular:MEASurement:TOUT <time>	:TRIGger:CELLular:MEASurement:TOUT?	<time>

Sequence Parameter Information

Function	Command	Query	Response
Sequence Parameter Information - Error Check	-----	:FETCh:CELLular:SEQuence:ERRor? [<item>]	<n>,<err(n-1)>,<ns>,<seg(ns-1)>,<e>,<mem>,<exe>,<set>
Sequence Parameter Information - Error Check	-----	:FETCh:CELLular:SEQuence:ERRor2? <format>	<n>,<err(n-1)>

Sequence Table Parameters

Function	Command	Query	Response
Sequence Table Parameter - TRX Control	:CONFigure:CELLular:SEQuence:RFSettings:TRX <seg>,<ul_freq>,<ref>,<dl_freq>,<level>,<pat>	:CONFigure:CELLular:SEQuence:RFSettings:TRX? <seg>	<ul_freq>,<ref>,<dl_freq>,<level>,<pat>
Sequence Table Parameter - Uplink Frequency, Input Level	:CONFigure:CELLular:SEQuence:RFSettings:TX <seg>,<ul_freq>,<ref>	:CONFigure:CELLular:SEQuence:RFSettings:TX? <seg>	<ul_freq>,<ref>
Sequence Table Parameter - SG Output Port	:CONFigure:CELLular:SEQuence:RXPort <seg>,<port>	:CONFigure:CELLular:SEQuence:RXPort? <seg>	<port>
Sequence Table Parameter - Measurement	:CONFigure:CELLular:SEQuence:SETup <seg>,<mode>,<step>,<mcond>	:CONFigure:CELLular:SEQuence:SETup? <seg>	<mode>,<step>,<mcond>
Sequence Table Parameter - Trigger	:TRIGger:CELLular:SEQuence <seg>,<src>,<slope>,<level>,<delay>	:TRIGger:CELLular:SEQuence? <seg>	<src>,<slope>,<level>,<delay>

Tx Power Measurement Condition Parameters

Function	Command	Query	Response
Tx Power - Bandwidth	:CONFigure:CELLular:SEQuence :TXPower:FILTer <bw>	:CONFigure:CELLular:SEQuence :TXPower:FILTer?	<bw>
Tx Power - Output Level Pattern Select	:CONFigure:CELLular:SEQuence :TXPower:OLEVel <mcond>,<pat>	:CONFigure:CELLular:SEQuence :TXPower:OLEVel? <mcond>	<pat>
Tx Power - Measurement Window Offset and Window Length	:CONFigure:CELLular:SEQuence :TXPower:PERiod <offset>,<mw>	:CONFigure:CELLular:SEQuence :TXPower:PERiod?	<offset>,<mw>
Tx Power - Step Count	:CONFigure:CELLular:SEQuence :TXPower:SCOunt <mcond>,<count>	:CONFigure:CELLular:SEQuence :TXPower:SCOunt? <mcond>	<count>
Tx Power - Step Time	:CONFigure:CELLular:SEQuence :TXPower:STIMe <stime>	:CONFigure:CELLular:SEQuence :TXPower:STIMe?	<stime>

Tx Power Result

<table>
<tr><th>Function</th><th>Command</th><th>Query</th><th>Response</th></tr>
<tr><td>Tx Power - Power</td><td>-----</td><td>:FETCh:CELLular:SEQuence:TXPower:TXPower? <seg>[,<mode>]</td><td>{<s>,<p(0),…,<p(s-1)>}<|p_ave></td></tr>
<tr><td>Tx Power - Power</td><td>-----</td><td>:FETCh:CELLular:SEQuence:TXPower:TXPower:ALL?</td><td>{<s1>,<p(0)>,<p(1)>,…,<p(s1-1)>}|{<s2>,<p_ave(0)>,<p_ave(1)>,…,<p_ave(s2-1)>}</td></tr>
</table>

Tx Power System Parameters

Function	Command	Query	Response
Tx Power - System Output Level Pattern Definition (0 to 99)	:CONFigure:CELLular:SEQuence :TXPower:OLPattern0 <pat>,<level(n)>	:CONFigure:CELLular:SEQuence :TXPower:OLPattern0? <pat>	<level(n)>
Tx Power - System Output Level Pattern Definition (50 to 99)	:CONFigure:CELLular:SEQuence :TXPower:OLPattern1 <pat>,<level(n)>	:CONFigure:CELLular:SEQuence :TXPower:OLPattern1? <pat>	<level(n)>

4.2 Details of Commands

This section describes commands in alphabetic order.

■ Terms in this command list

EX .... Command name (header)

Example .... Command function name

Function .... Command function

Command................................. Programming command syntax

Query .... Query syntax

Response .... Response syntax

Parameter .... Parameter definition

Details .... Command restrictions and others

Example of Use................................ Command usage example

Related Commands ....Introduction of related commands

■ Suffix Code list

Suffix Code	Unit	Suffix Code	Unit
DB	dB	MHZ	MHz
DBM	dBm	MS	ms
GHZ	GHz	MZ	MHz
GZ	GHz	NS	ns
HZ	Hz	S	s
KHZ	kHz	US	µs
KZ	kHz		

4.2.1 Common commands

:ABORt:CELLular:MEASurement

Stop Measure

Function

Stops measurement

Command

```
:ABORt:CELLular:MEASurement
```

Example of Use

To stop measurement:

:ABOR:CELL:MEAS

:CONFigure:CELLular:GENerator:ARB:PACKage:SELect

Waveform File Select

Function

Selects waveform pattern file for any waveform signals used at downlink signal modulation

Command

```
:CONFigure:CELLular:GENerator:ARB:PACKage:SELect <pac>
```

Query

```
:CONFigure:CELLular:GENerator:ARB:PACKage:SELect?
```

Response

<pac>

Parameter

<pac>	Waveform file name

Details

The number of the file used from the waveform pattern files loaded into waveform memory is set by this command.

Example of Use

To set the waveform file from the waveform files loaded in memory:
:CONF:CELL:GEN:ARB:PACK:SEL “PAC1”
:CONF:CELL:GEN:ARB:PACK:SEL?
> PAC1

Related Command

Use the following command to read the package file in waveform memory.
:SOURce:GPRF:GENerator:ARB:FILE:LOAD
For details of the commands, refer to Chapter 5 “SCPI Command Reference” in the *MU887000A TRX Test Module Operation Manual*.
The following command can be used to query file names of pattern files 0 to 3 that have been read into waveform memory.
:SOURce:GPRF:GENerator:ARB:WAVeform:NAME?
For details of the commands, refer to Chapter 5 “SCPI Command Reference” in the *MU887000A TRX Test Module Operation Manual*.

Use the following commands to select a pattern to use from the waveform patterns included in the pattern file configured using the command described in this section.
:CONFigure:CELLular:GENerator:ARB:WAVeform:PATTern:SELect
:CONFigure:CELLular:GENerator:ARB:WAVeform:PATTern:SELect:SYNC
:CONFigure:CELLular:SEQuencer:RFSettings:TRX

:CONFigure:CELLular:GENerator:ARB:WAVeform:PATTern:SELect

Waveform Pattern Select

Function

Selects waveform pattern to use from patterns included in waveform pattern file

When the command received, the signal is immediately switched regardless of the frame cycle of signal, so the frame cycle is not continued.

This command is also used to query the currently selected waveform pattern.

Command

```
:CONFigure:CELLular:GENerator:ARB:WAVeform:PATTern:SELect <pat>
```

Query

```
:CONFigure:CELLular:GENerator:ARB:WAVeform:PATTern:SELect?
```

Response

<pat>

Parameter

<pat>	Waveform pattern
PAT1 to PATn	Waveform pattern number (n: waveform information file group range)
Default	PAT1

Details

The output signal waveform pattern is set.

The pattern number is the same as the group number. Refer to Chapter 3, “Waveform File Details” in the *Waveform Files for Cellular Application Operation Manual*.

Example of Use

To set waveform pattern 1:

:CONF:CELL:GEN:ARB:WAV:PATT:SEL PAT1

:CONF:CELL:GEN:ARB:WAV:PATT:SEL?

> PAT1

Related Command

Sets or queries waveform pattern file for any waveform signal

:CONFigure:CELLular:GENerator:ARB:PACKage:SELect

Remarks

The group number depends on the selected waveform file.

For details of the waveform pattern, refer to Chapter 3, “Waveform File Details” in the *Waveform Files for Cellular Application Operation Manual*.

:CONFigure:CELLular:GENerator:ARB:WAVeform:PATTern:SELect:SYNC

Waveform Pattern Select (SYNC)

Function

Selects waveform pattern to use from patterns included in waveform pattern file
When the command received, the signal is switched according to the frame cycle of signal so that the frame cycle is continued.
This command is also used to query the currently selected waveform pattern.

Command

```
:CONFigure:CELLular:GENerator:ARB:WAVeform:PATTern:SELect:SYNC <pat>
```

Query

```
:CONFigure:CELLular:GENerator:ARB:WAVeform:PATTern:SELect:SYNC?
```

Response

<pat>

Parameter

<pat>	Waveform pattern
PAT1 to PATn	Waveform pattern number (n: waveform information file group range)
Default	PAT1

Details

The output signal waveform pattern is set.
The pattern number is the same as the group number. Refer to Chapter 3, "Waveform File Details" in the *Waveform Files for Cellular Application Operation Manual*.

Example of Use

To set waveform pattern 1:
:CONF:CELL:GEN:ARB:WAV:PATT:SEL:SYNC PAT1
:CONF:CELL:GEN:ARB:WAV:PATT:SEL:SYNC?
> PAT1

Related Command

Sets or queries waveform pattern file for any waveform signal
:CONFigure:CELLular:GENerator:ARB:PACKage:SELect

Remarks

The group number depends on the selected waveform file.
For details of the waveform pattern, refer to Chapter 3, "Waveform File Details" in the *Waveform Files for Cellular Application Operation Manual*.

:CONFigure:CELLular:GENerator:BBMode

Modulation

Function

Sets or queries MU887000A RF signal output modulation

Command

```
:CONFigure:CELLular:GENerator:BBMode <OnOff>
```

Query

```
:CONFigure:CELLular:GENerator:BBMode?
```

Response

<OnOff>

Parameter

<OnOff>	Modulation setting
ON	Sets RF output signal modulation ON
OFF	Sets RF output signal modulation OFF (CW)
Default	ON

Example of Use

To modulate the RF signal:

:CONF:CELL:GEN:BBM ON

:CONF:CELL:GEN:BBM?

> ON

:CONFigure:CELLular:GENerator:RFSettings:STATe

Output Level On/Off

Function

Sets or queries RF signal output at MU887000A connector

Command

```
:CONFigure:CELLular:GENerator:RFSettings:STATe <OnOff>
```

Query

```
:CONFigure:CELLular:GENerator:RFSettings:STATe?
```

Response

<OnOff>

Parameter

<OnOff>	RF signal output ON/OFF
ON	Outputs RF signal
OFF	Stop RF signal output
Default	ON

Example of Use

To output RF signals at MU887000A connector:

:CONF:CELL:GEN:RFS:STAT ON

:CONF:CELL:GEN:RFS:STAT?

> ON

Related Command

:ROUTe:PORT:CONNect:DIRection

:CONFigure:CELLular:MEASurement:STANdard

Standard Select

Function

Sets or queries measurement standard.

Command

```
:CONFigure:CELLular:MEASurement:STANdard <std>
```

Query

```
:CONFigure:CELLular:MEASurement:STANdard?
```

Response

<std>

Parameter

<std>	Measurement standard	
COMMON	Common measurement	(requires MX887010A)
WCDMA	W-CDMA	(requires MX887011A)
GSM	GSM	(requires MX887012A)
LTE	LTE	(requires MX887013A or MX887014A)
CDMA2000	CDMA2000	(requires MX887015A)
EVDO	EVDO	(requires MX887016A)
TDSCDMA	TD-SCDMA	(requires MX887017A)
SEQUENCE	Sequence	(requires MX887010A)
SEQ	Sequence	(requires MX887010A)
Default	COMMON	

Details

This command selects the measurement standard depending on the application software or the sequence measurement.

Sending this command during measurement, aborts measurement to switch the measurement standard.

Example of Use

To switch the measurement standard to GSM:

:CONF:CELL:MEAS:STAN GSM

:CONF:CELL:MEAS:STAN?

> GSM

Remarks

If the measurement standard is switched, the pre-switching results are cleared.

:FETCh:CELLular:MEASurement:STATe?

Measurement Status

Function

Queries measurement status

Query

```
:FETCh:CELLular:MEASurement:STATe?
```

Response

<state>

Parameter

<state>	Measurement status
0	Measurement ended normally
2	Level over
3	Under level
4	Measurement failed
5	Synchronization word not detected
9	Measurement in progress or not measured
12	Timeout of Tx measurement
13	Rx measurement failed

Details

This command can be used while measurement is in progress or suspended.
The value received from MX887010A is 0, 2, 9, or 12.

Example of Use

To query current measurement status:
:FETC:CELL:MEAS:STAT?
> 0

:INITiate:CELLular:MEASurement:SINGle

Measurement Start

Function

Sets the parameters for both specified measurement and signal transmission and executes measurement.

Command

```
:INITiate:CELLular:MEASurement:SINGle
```

Details

Sending this command executes one measurement.
Sending the command during measurement, aborts measurement once and restarts it.
The measurement questionable register must be polled or sync processing via *WAI is required for the timing of measurement completion.

Example of Use

To start measurement:
:INIT:CELL:MEAS:SING

Related Command

:STATus:QUEStionable:MEASure[:EVENt]
For the details of the questionable register, refer to Chapter 3 “Fundamental Operation”in the *MU887000A TRX Test Module Operation Manual*.

:INSTrument[:SELect]

Application Select

Function

Sets or queries type of application software

Command

```
:INSTrument[:SELect] <app>
```

Query

```
:INSTrument[:SELect]?
```

Response

<app>

Parameter

<app>	Type of application software
CELLULAR	When using MX887010A, MX887011A, MX887012A, MX887013A, MX887014A, MX887015A, MX887016A or MX887017A
SRW	When using MX887030A, MX887031A, MX887040A, or MX887050A

Details

Set the parameter to CELLULAR and send the command before using the MX887010A features

Example of Use

To set the application software to cellular application:
:INST CELLULAR
:INST?
> CELLULAR

Remarks

Set the parameter to CELLULAR using :INSTrument[:SELect], and then set the measurement standard using :CONFigure:CELLular:MEASurement:STANdard.
If the parameter has been set to COMMON
using :CONFigure:CELLular:MEASurement:STANdard, set the measurement items
using :CONFigure:CELLular:MEASurement:SELEct.

:ROUTe:PORT:CONNect:DIRection

Set Connect Port Direction

Function

Sets or queries connectors for inputting and outputting RF signals

Command

```
:ROUTe:PORT:CONNect:DIRection <input>,<output>
```

Query

```
:ROUTe:PORT:CONNect:DIRection?
```

Response

<input>,<output>

Parameter

<input>	Test Port No.
PORT1	Test Port1
PORT2	Test Port2
PORT3	Test Port3
PORT4	Test Port4
Default	PORT1
<output>	Test Port No.
PORT1	Test Port1
PORT2	Test Port2
PORT3	Test Port3
PORT4	Test Port4
Default	PORT1

Details

Both Test Port1 and Test Port2 can be set to input and output simultaneously.
Test Port3 and Test Port4 can be set to either input or output at one time.

Example of Use

To set Test Port1 as RF signal input connector and Test Port2 as RF signal output connector:

:ROUT:PORT:CONN:DIR PORT1,PORT2
:ROUT:PORT:CONN:DIR?
> PORT1,PORT2

:STATus:OPERation:MEASure[:EVENt]?

Measurement Operation Status Register Query

Function

Queries content of measurement operation status register
The event occurrence can be identified using the retrieved value.

Query

```
:STATus:OPERation:MEASure[:EVENt]?
```

Response

<mosr>

Value = bit0 + bit1 + ... + bit15

bit0 = 2^0 = 1	Measurement in progress
bit1 = 2^1 = 2	Trigger preparation completed
bit2 = 2^2 = 4	Unused
bit3 = 2^3 = 8	Unused
bit4 = 2^4 = 16	Unused
bit5 = 2^5 = 32	Unused
bit6 = 2^6 = 64	Unused
bit7 = 2^7 = 128	Unused
bit8 = 2^8 = 256	Unused
bit9 = 2^9 = 512	Unused
bit10 = 2^{10} = 1024	Unused
bit11 = 2^{11} = 2048	Unused
bit12 = 2^{12} = 4096	Unused
bit13 = 2^{13} = 8192	Unused
bit14 = 2^{14} = 16384	Unused
bit15 = 2^{15} = 32768	Unused

Parameter

<mosr>	Measurement operation status register
Range	0 to 65535

Details

The sum of the values for bits of the occurring event from the values $2^0 = 1$, $2^1 = 2$ to $2^{15} = 32768$, that correspond to the measurement operation status register bits 0, 1 to 15 becomes the response.

Example of Use

To query content of measurement operation status register:
:STAT:OPER:MEAS?
> 1

:STATus:QUEStionable:MEASure[:EVENt]?

Measurement Questionable Status Register Query

Function

Queries content of measurement questionable status register
The event occurrence can be identified using the retrieved value.

Query

```
:STATus:QUEStionable:MEASure[:EVENt]?
```

Response

<mqsr>

Value = bit0 + bit1 + ... + bit15

bit0 = 2^0 = 1	Level over
bit1 = 2^1 = 2	Level under
bit2 = 2^2 = 4	Timeout
bit3 = 2^3 = 8	Unused
bit4 = 2^4 = 16	Unused
bit5 = 2^5 = 32	Unused
bit6 = 2^6 = 64	Unused
bit7 = 2^7 = 128	Unused
bit8 = 2^8 = 256	Unused
bit9 = 2^9 = 512	Unused
bit10 = 2^{10} = 1024	Unused
bit11 = 2^{11} = 2048	Unused
bit12 = 2^{12} = 4096	Unused
bit13 = 2^{13} = 8192	Unused
bit14 = 2^{14} = 16384	Unused
bit15 = 2^{15} = 32768	Unused

Parameter

<mqsr>	Measurement questionable status register	
Range		0 to 65535

Details

The sum of the values for bits of the occurring event from the values $2^0 = 1$, $2^1 = 2$ to $2^{15} = 32768$, that correspond to the measurement questionable status register bits 0, 1 to 15 becomes the response.

Example of Use

To query content of measurement questionable status register:
:STAT:QUES:MEAS?
> 1

:SYSTem:LANGuage

Language Selection of Remote Command

Function

Switches language mode of remote control command

Command

```
:SYSTem:LANGuage <mode>
```

Query

```
:SYSTem:LANGuage?
```

Response

<mode>

Parameter

<mode>	Language mode
NATive	Native
SCPI	SCPI
Default	Native

Example of Use

To set the remote control command language mode to Native:

:SYST:LANG NAT

:SYST:LANG?

>NAT

4.2.2 Fundamental measurement commands

:CONFigure:CELLular:COMMon:IQCapture:FILTer

IQ Capture - Measurement Bandwidth

Function

Sets or queries the measurement bandwidth for IQ Capture

Command

```
:CONFigure:CELLular:COMMon:IQCapture:FILTer <bw>
```

Query

```
:CONFigure:CELLular:COMMon:IQCapture:FILTer?
```

Response

<bw>

Parameter

<bw>	Measurement bandwidth
20MHZ	20 MHz
5MHZ	5 MHz
3MHZ	3 MHz
1MHZ	1 MHz
500KHZ	500 kHz
300KHZ	300 kHz
100KHZ	100 kHz
GSM	GSM (Gauss 1 MHz)
Default	20MHZ

Example of Use

To set the measurement bandwidth for IQ Capture to 20 MHz:

:CONF:CELL:COMM:IQC:FILT 20MHZ

:CONF:CELL:COMM:IQC:FILT?

>20MHZ

:CONFigure:CELLular:COMMon:IQCapture:TSPan

IQ Capture - Time Span

Function

Sets or queries the time span for IQ Capture

Command

```
:CONFigure:CELLular:COMMon:IQCapture:TSPan <tspan>
```

Query

```
:CONFigure:CELLular:COMMon:IQCapture:TSPan?
```

Response

```
<tspan>
```

Unit	µs

Parameter

<tspan>	Time span
Range	1000 to 10000
Resolution	1
Suffix Code	NS, US, MS, S (uses µs when omitted)
Default	1000

Example of Use

To set the time span for IQ Capture to 10 ms:

:CONF:CELL:COMM:IQC:TSP 10000

:CONF:CELL:COMM:IQC:TSP?

>10000

:CONFigure:CELLular:COMMon:MULTipower:FILTer

Multiple Power Measurement - Filter

Function

Sets or queries multiple power measurement filters

Command

```
:CONFigure:CELLular:COMMon:MULTipower:FILTer <filter>
```

Query

```
:CONFigure:CELLular:COMMon:MULTipower:FILTer?
```

Response

<filter>

Parameter

<filter>	Bandpass filter bandwidth
RRC	RRC 3.84 MHz filter
BW1.4MHZ	BW 1.4 MHz filter
BW3MHZ	BW 3 MHz filter
BW5MHZ	BW 5 MHz filter
BW10MHZ	BW 10 MHz filter
BW15MHZ	BW 15 MHz filter
BW20MHZ	BW 20 MHz filter
CDMA2K	CDMA2K 1.2288 MHz filter
Default	BW5MHZ

Example of Use

To set the filter bandwidth to 5 MHz:
:CONF:CELL:COMM:MULT:FILT BW5MHz
:CONF:CELL:COMM:MULT:FILT?
> BW5MHZ

:CONFigure:CELLular:COMMon:MULTipower:IROutput

Multiple Power Measurement - Invalid Result Output

Function

Sets or queries display method for measurement results after invalid measurement interval at multiple power measurement

Command

```
:CONFigure:CELLular:COMMon:MULTipower:IROutput <on_off>
```

Query

```
:CONFigure:CELLular:COMMon:MULTipower:IROutput?
```

Response

<on_off>

Parameter

<on_off>	Display method for invalid measurement results
ON	Numeric value
OFF	Invalid value (999.99)
Default	OFF

Details

Power is not measured correctly when the level of a slot with set input level changes. In this case, this command sets the measurement results display. When the ON parameter is set, the actual invalid measurement result value is output as is.

When the OFF parameter is set, the measurement result is displayed as 999.99, indicating the measurement is invalid.

Example of Use

To display the result from the invalid measurement interval as 999.99:

:CONF:CELL:COMM:MULT:IRO OFF

:CONF:CELL:COMM:MULT:IRO?

> OFF

:CONFigure:CELLular:COMMon:MULTipower:PERiod

Multiple Power Measurement - Measurement Window Offset & Measurement Window

Function

Sets or queries measurement interval and offset multiple power measurement

Command

```
:CONFigure:CELLular:COMMon:MULTipower:PERiod <offset>,<meas_window>
```

Query

```
:CONFigure:CELLular:COMMon:MULTipower:PERiod?
```

Response

<offset>,<meas_window>

Unit	%

Parameters

<offset>	Offset
Range	0 to 75%
Resolution	1%
Default	25%
<meas_window>	Measurement interval
Range	1 to 90%
Resolution	1%
Default	55%

Details

The offset and the measurement interval are specified as a proportional ratio (%) to the step time.
Set the offset and measurement interval so that total is less than 100%.

Example of Use

To set the offset of the measurement interval to 10% and the measurement interval to 80%:
:CONF:CELL:COMM:MULT:PER 10,80
:CONF:CELL:COMM:MULT:PER?
> 10,80

:CONFigure:CELLular:COMMon:MULTipower:STEP:NUM

Multiple Power Measurement - Number of Steps

Function

Sets or queries number of steps measured at multiple power measurement

Command

```
:CONFigure:CELLular:COMMon:MULTipower:STEP:NUM <numstep>
```

Query

```
:CONFigure:CELLular:COMMon:MULTipower:STEP:NUM?
```

Response

<numstep>

Parameter

<numstep>	Number of measurement steps
Range	10 to 100
Resolution	1
Default	30

Example of Use

To set the number of measurement steps to 40:

:CONF:CELL:COMM:MULT:STEP:NUM 40

:CONF:CELL:COMM:MULT:STEP:NUM?

> 40

:CONFigure:CELLular:COMMon:MULTipower:STEP:TIME

Multiple Power Measurement - Power Step Time

Function

Sets or queries duration of each step at multiple power measurement

Command

```
:CONFigure:CELLular:COMMon:MULTipower:STEP:TIME <steptime>
```

Query

```
:CONFigure:CELLular:COMMon:MULTipower:STEP:TIME?
```

Response

<steptime>

Parameter

<steptime>	Step time width
0.5	0.5 ms
1	1 ms
2	2 ms
4	4 ms
5	5 ms
10	10 ms
20	20 ms
30	30 ms
40	40 ms
50	50 ms
60	60 ms
70	70 ms
80	80 ms
Default	20

Example of Use

To set the step time width to 10 ms:

:CONF:CELL:COMM:MULT:STEP:TIME 10

:CONF:CELL:COMM:MULT:STEP:TIME?

> 10

:CONFigure:CELLular:COMMon:MULTipower:TXRef

Multiple Power Measurement - Input Level Control

Function

Sets or queries control of input levels at multiple power measurement

Command

```
:CONFigure:CELLular:COMMon:MULTipower:TXRef
<s>[,ref(0)[,<n(1)>,<ref(1)>[,…[,<n(i)> ,<ref(i)>],…]]
```

Query

```
:CONFigure:CELLular:COMMon:MULTipower:TXRef?
```

Response

<s>,<ref(0)>,<n(1)>,<ref(1)>,<n(2)>,<ref(2)>,…

Parameters

<s>	Switching the input level control
ON	Input level control enabled
OFF	Input level control disabled
<ref(i)>	(i)th input level (dBm)
Range	–65.0 to +35.0 dBm (Port1/Port2)
	–65.0 to +25.0 dBm (Port3/Port4)
Resolution	0.1 dBm
Suffix Code	DBM (uses dBm when omitted)
<n(i)>	(i)th step number where input level changed
Range	1 to 99
Resolution	1

Details

- The ref(0) and subsequent ref(i) arguments can be omitted when <s> is set to OFF. Note that n(x) and ref(x) should be set or omitted as a pair.
- The input level should be set to ILVL when <s> is set to OFF.
- The n(1) and subsequent n(i) arguments can be omitted when <s> is set to ON. Note that n(x) and ref(x) should be set or omitted as a pair.
- ref(0) is the input level of the first step. Therefore, the segment number n(x) cannot be set.
- When command parameters are omitted, the number of parameters in the query responses must be the same as the number of parameters set by the command.
- n(x) configures the value of (number of measurement steps – 1) or less.
- When cable loss correction is set to ON, the setting range for <ref(i)> must be the range of values with added cable loss.

Example: If the cable loss is 5 dB, the range between –60.0 and 40.0 dB is used.
In this case, if the input level is set to –65.0 dB, an "out of parameter setting range" error occurs.
(The response to :SYSTem:ERRor? returns 220, meaning "Parameter error".)
Send :INITiate:CELLular:MEASurement:SINGle to query whether the configured level is within the parameter range.

Example of Use

To set the input level control to ON, the input level at the first step to 24 dBm, the input levels at the 20th and subsequent segments to 0 dBm, and the input level at the 30th and subsequent segments to –20 dBm:

:CONF:CELL:COMM:MULT:TXR ON,24,20,0,30,-20
:CONF:CELL:COMM:MULT:TXR?
> ON,24.0,20,0.0,30,-20.0

Related Command

:CONFigure:CELLular:MEASurement:RFSettings:LEVel

:CONFigure:CELLular:COMMon:NARRowband:PERiod

Narrowband Power vs Time - Measurement Window Offset and Measurement Window

Function

Sets or queries measurement offset and measurement interval for Narrowband Power vs Time measurement

Command

```
:CONFigure:CELLular:COMMon:NARRowband:PERiod <offset>,<meas_window>
```

Query

```
:CONFigure:CELLular:COMMon:NARRowband:PERiod?
```

Response

<offset>,<meas_window>

Unit	%

Parameters

<offset>	Offset
Range	0 to 90%
Resolution	1%
Default	25%
<meas_window>	Measurement interval
Range	10 to 100%
Resolution	1%
Default	50%

Details

The offset and the measurement interval are specified as a proportional ratio (%) to the segment duration.
Set the offset and the measurement interval so that the total is less than 100%.

Example of Use

To set the offset and measurement interval for Narrowband Power vs Time to 20% and 60%, respectively:
:CONF:CELL:COMM:NARR:PER 20,60
:CONF:CELL:COMM:NARR:PER?
> 20,60

:CONFigure:CELLular:COMMon:NARRowband:SEGMent

Narrowband Power vs Time - Segment Duration and Number of Segments

Function

Sets or queries segment duration and number of segments at Narrowband Power vs Time measurement

Command

```
:CONFigure:CELLular:COMMon:NARRowband:SEGMent <duration>,<num>
```

Query

```
:CONFigure:CELLular:COMMon:NARRowband:SEGMent?
```

Response

<duration>,<num>

Parameters

<duration>	Segment duration
Range	200 to 20000 μs
Resolution	1 μs
Suffix Code	NS, US, MS, S (uses μs when omitted)
Default	1000 μs
<num>	Number of segments
Range	1 to 1000
Resolution	1
Default	500

Example of Use

To set the segment duration and the number of segments measured at Narrowband Power vs Time to 2000 μs and 300, respectively:

:CONF:CELL:COMM:NARR:SEGM 2000,300
:CONF:CELL:COMM:NARR:SEGM?
> 2000,300

:CONFigure:CELLular:COMMon:SPMonitor:DETect

Spectrum Monitor - Detect Mode

Function

Sets or queries detection mode at spectrum monitor measurement

Command

```
:CONFigure:CELLular:COMMon:SPMonitor:DETect <mode>
```

Query

```
:CONFigure:CELLular:COMMon:SPMonitor:DETect?
```

Response

<mode>

Parameter

<mode>	Detection mode
PEAK	Peak detection
RMS	RMS detection
Default	PEAK

Example of Use

To set the detection mode to RMS:

:CONF:CELL:COMM:SPM:DET RMS

:CONF:CELL:COMM:SPM:DET?

> RMS

:CONFigure:CELLular:COMMon:SPMonitor:PMBW

Spectrum Monitor - Power Measurement Bandwidth

Function

Sets or queries power measurement bandwidth at spectrum monitor measurement

Command

```
:CONFigure:CELLular:COMMon:SPMonitor:PMBW <width>
```

Query

```
:CONFigure:CELLular:COMMon:SPMonitor:PMBW?
```

Response

<width>

Unit	MHz

Parameter

<width>	Bandwidth (varies with frequency span)	
Range	0.001 to 1.000 MHz	(when frequency span is 1 MHz)
	0.001 to 2.500 MHz	(when frequency span is 2.5 MHz)
	0.001 to 5.000 MHz	(when frequency span is 5 MHz)
	0.001 to 10.000 MHz	(when frequency span is 10 MHz)
	0.001 to 25.000 MHz	(when frequency span is 25 MHz)
	0.001 to 50.000 MHz	(when frequency span is 50 MHz)
	0.001 to 100.000 MHz	(when frequency span is 100 MHz)
	0.001 to 160.000 MHz	(when frequency span is 160 MHz)
Resolution	0.001 MHz	
Suffix Code	HZ, KHZ, KZ, MHZ, MZ, GHZ, GZ (uses MHz when omitted)	
Default	1.000 MHz	(when frequency span is 1 MHz)
	2.500 MHz	(when frequency span is 2.5 MHz)
	5.000 MH	(when frequency span is 5 MHz)
	10.000 MHz	(when frequency span is 10 MHz)
	25.000 MHz	(when frequency span is 25 MHz)
	50.000 MHz	(when frequency span is 50 MHz)
	100.000 MHz	(when frequency span is 100 MHz)
	160.000 MHz	(when frequency span is 160 MHz)

Details

The power measurement bandwidth is set to the span value or less.

Examples of Use

To set the frequency span to 5 MHz:
:CONF:CELL:COMM:SPM:SPAN 5MHZ
:CONF:CELL:COMM:SPM:SPAN?
> 5MHZ

To set the power measurement bandwidth to 2.5 MHz:
:CONF:CELL:COMM:SPM:PMBW 2.5MHZ
:CONF:CELL:COMM:SPM:PMBW?
> 2.5MHZ

:CONFigure:CELLular:COMMon:SPMonitor:RBW

Spectrum Monitor - Resolution Bandwidth

Function

Sets or queries resolution bandwidth (RBW) at spectrum monitor measurement

Command

```
:CONFigure:CELLular:COMMon:SPMonitor:RBW <bandwidth>
```

Query

```
:CONFigure:CELLular:COMMon:SPMonitor:RBW?
```

Response

<bandwidth>

Parameter

<bandwidth>	RBW
100HZ	100 Hz
300HZ	300 Hz
1KHZ	1 kHz
3KHZ	3 kHz
10KHZ	10 kHz
30KHZ	30 kHz
100KHZ	100 kHz
300KHZ	300 kHz
1MHZ	1 MHz
Default	100KHZ

Example of Use

To set the RBW to 3 kHz:

:CONF:CELL:COMM:SPM:RBW 3KHZ

:CONF:CELL:COMM:SPM:RBW?

> 3KHZ

Remarks

The RBW setting range is limited by the frequency span setting.

For the relationship between span and resolution, refer to Table 2.2.1-1 “Span and Resolution Setting Range and Number of Data Points”.

:CONFigure:CELLular:COMMon:SPMonitor:SPAN

Spectrum Monitor - Span

Function

Sets or queries frequency span at spectrum monitor measurement

Command

```
:CONFigure:CELLular:COMMon:SPMonitor:SPAN <span>
```

Query

```
:CONFigure:CELLular:COMMon:SPMonitor:SPAN?
```

Response

<span>

Parameter

<span>	Frequency span
1MHZ	1 MHz
2.5MHZ	2.5 MHz
5MHZ	5 MHz
10MHZ	10 MHz
25MHZ	25 MHz
50MHZ	50 MHz
100MHZ	100 MHz
160MHZ	160 MHz
Default	25 MHZ

Example of Use

To set the frequency span to 5 MHz:

:CONF:CELL:COMM:SPM:SPAN 5MHZ

:CONF:CELL:COMM:SPM:SPAN?

> 5MHZ

Remarks

For the relationship between span and resolution, refer to Table 2.2.1-1 “Span and Resolution Setting Range and Number of Data Points”.

:CONFigure:CELLular:COMMon:SPMonitor:STORage:COUNt

Spectrum Monitor - Storage Count

Function

Sets or queries number of data acquisitions at spectrum monitor measurement

Command

```
:CONFigure:CELLular:COMMon:SPMonitor:STORage:COUNt <count>
```

Query

```
:CONFigure:CELLular:COMMon:SPMonitor:STORage:COUNt?
```

Response

<count>

Parameter

<count>	Number of data acquisitions
Range	2 to 100
Resolution	1
Default	10

Example of Use

To set the number of data acquisitions to 100:

:CONF:CELL:COMM:SPM:STOR:COUN 100

:CONF:CELL:COMM:SPM:STOR:COUN?

> 100

:CONFigure:CELLular:COMMon:SPMonitor:STORage:MODE

Spectrum Monitor - Storage Mode

Function

Sets or queries method for saving spectrum monitor measurements

Command

```
:CONFigure:CELLular:COMMon:SPMonitor:STORage:MODE <mode>
```

Query

```
:CONFigure:CELLular:COMMon:SPMonitor:STORage:MODE?
```

Response

<mode>

Parameter

<mode>	Method for saving measurement results
OFF	Latest measurement result
AVG	Average value calculated from total measurements
MAX	Maximum result of multiple measurements
MIN	Minimum result of multiple measurements
Default	OFF

Example of Use

To set the method for saving the measurement results to save the maximum result of multiple measurements:

:CONF:CELL:COMM:SPM:STOR:MODE MAX
:CONF:CELL:COMM:SPM:STOR:MODE?
> MAX

Related Commands

:CONFigure:CELLular:COMMon:SPMonitor:STORage:COUNt

:CONFigure:CELLular:COMMon:SPMonitor:TIME

Spectrum Monitor - Analysis Time

Function

Sets or queries analysis time at spectrum monitor measurement

Command

```
:CONFigure:CELLular:COMMon:SPMonitor:TIME <anlylen>
```

Query

```
:CONFigure:CELLular:COMMon:SPMonitor:TIME?
```

Response

<anlylen>

Parameter

<anlylen>	Analysis time
1MS	1 ms
10MS	10 ms
Default	1 MS

Example of Use

To set the analysis time to 10 ms:

:CONF:CELL:COMM:SPM:TIME 10MS

:CONF:CELL:COMM:SPM:TIME?

> 10MS

:CONFigure:CELLular:COMMon:TRXFrequency:FILTer

Tx/Rx vs Frequency Measurement - Filter

Function

Sets or queries filters at Tx/Rx vs. Frequency measurement

Command

```
:CONFigure:CELLular:COMMon:TRXFrequency:FILTer <filter>
```

Query

```
:CONFigure:CELLular:COMMon:TRXFrequency:FILTer?
```

Response

<filter>

Parameter

<filter>	Filter
RRC	RRC 3.84 MHz filter
BW1.4MHZ	BW 1.4 MHz filter
BW3MHZ	BW 3 MHz filter
BW5MHZ	BW 5 MHz filter
BW10MHZ	BW 10 MHz filter
BW15MHZ	BW 15 MHz filter
BW20MHZ	BW 20 MHz filter
CDMA2K	CDMA2K 1.2288 MHz filter
Default	BW5MHZ

Example of Use

To set the filter bandwidth to 5 MHz:
:CONF:CELL:COMM:TRXF:FILT BW5MHz
:CONF:CELL:COMM:TRXF:FILT?
> BW5MHZ

:CONFigure:CELLular:COMMon:TRXFrequency:FREQuency

Tx/Rx vs Frequency Measurement - Registration of Tx/Rx Frequency

Function

Sets or queries input/output RF signal frequency for sequences 0 through 99 at Tx/Rx vs. Frequency measurement

Command

```
:CONFigure:CELLular:COMMon:TRXFrequency:FREQuency
<dlfreq(0)>,<ulfreq(0)>[,<dlfreq(1)>,<ulfreq(1)>[,…[,<dlfreq(399)>,<ulfre
q(399)>]…]]
```

Query

```
:CONFigure:CELLular:COMMon:TRXFrequency:FREQuency?
```

Response

<dlfreq(0)>,<ulfreq(0)>,<dlfreq(1)>,<ulfreq(1)>, ... ,<dlfreq(399)>,<ulfreq(399)>

Unit	MHz

Parameters

<dlfreq(n)>	Downlink frequency of sequence number n
Range	400.000000 to 6000.000000 MHz
Resolution	0.0001 MHz
Suffix Code	HZ, KHZ, KZ, MHZ, MZ, GHZ, GZ (uses MHz when omitted)
Default	1000 MHz
<ulfreq(n)>	Uplink frequency of sequence number n
Range	400.000000 to 6000.000000 MHz
Resolution	0.0001 MHz
Suffix Code	HZ, KHZ, KZ, MHZ, MZ, GHZ, GZ (uses MHz when omitted)
Default	2000 MHz

Details

- The parameter units are MHz. The dlfreq(n) and ulfreq(n) parameters are set as a pair without the unit.
- The parameters for the sequence 1 and subsequent sequences can be omitted. In this case, the number of responses does not exceed the registered number of sequences.

Example of Use

To set the frequency of sequences 0 and 1 to the following values:

Sequence	Output frequency	Input frequency
0	2110 MHz	1920 MHz
1	2170 MHz	1980 MHz

:CONF:CELL:COMM:TRXF:FREQ 2110,1920,2170,1980

:CONF:CELL:COMM:TRXF:FREQ?

> 2110.0000,1920.0000,2170.0000,1980.0000,…,1000.0000,2000.0000*

*: Actually, always returns 40 items even if not omitted.

:CONFigure:CELLular:COMMon:TRXFrequency:FREQuency2

Tx/Rx vs Frequency Measurement - Registration of Tx/Rx Frequency

Function

Sets or queries input/output RF signal frequency of sequences 10 through 19 at Tx/Rx vs. Frequency measurement
This command is used when setting sequence 10 or above.

Command

```
:CONFigure:CELLular:COMMon:TRXFrequency:FREQuency2
<dlfreq(10)>,<ulfreq(10)>[,<dlfreq(11)>,<ulfreq(11)>[,…[,<dlfreq(19)>,<ul
freq(19)>]…]]
```

Query

```
:CONFigure:CELLular:COMMon:TRXFrequency:FREQuency2?
```

Response

<dlfreq(10)>,<ulfreq(10)>,<dlfreq(11)>,<ulfreq(11)>, ... ,<dlfreq(19)>,<ulfreq(19)>

Unit	MHz

Parameters

<dlfreq(n)>	Downlink frequency of sequence number n
Range	400.000000 to 6000.000000 MHz
Resolution	0.0001 MHz
Suffix Code	HZ, KHZ, KZ, MHZ, MZ, GHZ, GZ (uses MHz when omitted)
Default	1000 MHz
<ulfreq(n)>	Uplink frequency of sequence number n
Range	400.000000 to 6000.000000 MHz
Resolution	0.0001 MHz
Suffix Code	HZ, KHZ, KZ, MHZ, MZ, GHZ, GZ (uses MHz when omitted)
Default	2000 MHz

Details

- The parameter units are MHz. The dlfreq(n) and ulfreq(n) parameters are set as a pair without the units.
- The parameters for the sequence 11 and subsequent sequences can be omitted. In this case, the number of responses does not exceed the registered number of sequences.
- After setting the frequency of the sequences 0 through 9 using :CONFigure:CELLular:COMMon:TRXFrequency:FREQuency, the frequency of sequences 10 through 19 can be set using this command.

Example of Use

With the output and input frequencies of sequence 0 set to 800 MHz and 900 MHz, respectively, to set both the downlink frequency and uplink frequency for sequences 1 through 19 so that both the uplink frequency and downlink frequency increment by +1 MHz through each of the sequences:

:CONF:CELL:COMM:TRXF:FREQ
800,900,801,901,802,902,803,903,804,904,805,905,806,906,807,907,808,908,809,909
:CONF:CELL:COMM:TRXF:FREQ?
>
800.0000,900.0000,801.0000,901.0000,802.0000,902.0000,803.0000,903.0000,804.0000,904.000
0,805.0000,905.0000,806.0000,906.0000,807.0000,907.0000,808.0000,908.0000,809.0000,909.00
00,…,1000.0000,2000.0000*
*: Actually, always returns 40 items even if not omitted.

:CONF:CELL:COMM:TRXF:FREQ2
810,910,811,911,812,912,813,913,814,914,815,915,816,916,817,917,818,918,819,919
:CONF:CELL:COMM:TRXF:FREQ2?
>
810.0000,910.0000,811.0000,911.0000,812.0000,912.0000,813.0000,913.0000,814.0000,914.000
0,815.0000,915.0000,816.0000,916.0000,817.0000,917.0000,818.0000,918.0000,819.0000,919.00
00

:CONFigure:CELLular:COMMon:TRXFrequency:FREQuency3

Tx/Rx vs Frequency Measurement - Registration of Tx/Rx Frequency

Function

Sets or queries input/output RF signal frequency of sequences 20 to 29 at Tx/Rx vs. Frequency measurement
The command is used to set sequence 20 or above.

Command

```
:CONFigure:CELLular:COMMon:TRXFrequency:FREQuency3
<dlfreq(20)>,<ulfreq(20)>[,<dlfreq(21)>,<ulfreq(21)>[,….[,<dlfreq(29)>,<u
lfreq(29)]…]]
```

Query

```
:CONFigure:CELLular:COMMon:TRXFrequency:FREQuency3?
```

Response

<dlfreq(20)>,<ulfreq(20)>,<dlfreq(21)>,<ulfreq(21)>, ... ,<dlfreq(29)>,<ulfreq(29)>

Unit	MHz

Parameters

<dlfreq(n)>	Downlink frequency of sequence number n
Range	400.000000 to 6000.000000 MHz
Resolution	0.0001 MHz
Suffix Code	HZ, KHZ, KZ, MHZ, MZ, GHZ, GZ (uses MHz when omitted)
Default	1000 MHz
<ulfreq(n)>	Uplink frequency of sequence number n
Range	400.000000 to 6000.000000 MHz
Resolution	0.0001 MHz
Suffix Code	HZ, KHZ, KZ, MHZ, MZ, GHZ, GZ
Default	2000 MHz

Details

- The parameter units are MHz. The dlfreq(n) and ulfreq(n) parameters are set as a pair without the units.
- The parameters for the sequence 21 and subsequent sequences can be omitted. In this case, the number of responses does not exceed the registered number of sequences.
- After setting the frequency of the sequences 0 through 9 using :CONFigure:CELLular:COMMon:TRXFrequency:FREQuency, and sequences 10 through 19 using :CONFigure:CELLular:COMMon:TRXFrequency:FREQuency2, the frequency of the sequences 20 through 29 can be set using this command.

Example of Use

With the output and input frequencies of sequence 0 set to 800 MHz and 900 MHz, respectively, to set both downlink frequency and uplink frequency of sequences 1 through 29 so that both the uplink frequency and downlink frequency increment by +1 MHz through each of the sequences:

:CONF:CELL:COMM:TRXF:FREQ
800,900,801,901,802,902,803,903,804,904,805,905,806,906,807,907,808,908,809,909
:CONF:CELL:COMM:TRXF:FREQ?
>
800.0000,900.0000,801.0000,901.0000,802.0000,902.0000,803.0000,903.0000,804.0000,904.000
0,805.0000,905.0000,806.0000,906.0000,807.0000,907.0000,808.0000,908.0000,809.0000,909.00
00,…,1000.0000,2000.0000*
*: Actually, always returns 40 items even if not omitted.

:CONF:CELL:COMM:TRXF:FREQ2
810,910,811,911,812,912,813,913,814,914,815,915,816,916,817,917,818,918,819,919
:CONF:CELL:COMM:TRXF:FREQ2?
>
810.0000,910.0000,811.0000,911.0000,812.0000,912.0000,813.0000,913.0000,814.0000,914.000
0,815.0000,915.0000,816.0000,916.0000,817.0000,917.0000,818.0000,918.0000,819.0000,919.00
00

:CONF:CELL:COMM:TRXF:FREQ3
820,920,821,921,822,922,823,923,824,924,825,925,826,926,827,927,828,928,829,929
:CONF:CELL:COMM:TRXF:FREQ3?
>
820.0000,920.0000,821.0000,921.0000,822.0000,922.0000,823.0000,923.0000,824.0000,924.000
0,825.0000,925.0000,826.0000,926.0000,827.0000,927.0000,828.0000,928.0000,829.0000,929.00
00

:CONFigure:CELLular:COMMon:TRXFrequency:FREQuency4

Tx/Rx vs Frequency Measurement - Registration of Tx/Rx Frequency

Function

Sets or queries input/output RF signal frequency of sequences 30 to 39 at Tx/Rx vs. Frequency measurement. The command is used to set sequence 30 or above.

Command

```
:CONFigure:CELLular:COMMon:TRXFrequency:FREQuency4
<dlfreq(30)>,<ulfreq(30)>[,<dlfreq(31)>,<ulfreq(31)>[,…[,<dlfreq(39)>,<ul
freq(39)>]…]]
```

Query

```
:CONFigure:CELLular:COMMon:TRXFrequency:FREQuency4?
```

Response

<dlfreq(30)>,<ulfreq(30)>,<dlfreq(31)>,<ulfreq(31)>, ... ,<dlfreq(39)>,<ulfreq(39)>

Unit	MHz

Parameters

<dlfreq(n)>	Downlink frequency of sequence number n
Range	400.000000 to 6000.000000 MHz
Resolution	0.0001 MHz
Suffix Code	HZ, KHZ, KZ, MHZ, MZ, GHZ, GZ (uses MHz when omitted)
Default	1000 MHz
<ulfreq(n)>	Uplink frequency of sequence number n
Range	400.000000 to 6000.000000 MHz
Resolution	0.0001 MHz
Suffix Code	HZ, KHZ, KZ, MHZ, MZ, GHZ, GZ (uses MHz when omitted)
Default	2000 MHz

Details

- The parameter units are MHz. The dlfreq(n) and ulfreq(n) parameters are set as a pair without the units.
- The parameters for the sequence 31 and subsequent sequences can be omitted. In this case, the number of responses does not exceed the registered number of sequences.
- After setting the frequency of the sequences 0 through 29 using the following command, the frequency of the sequences 30 through 39 can be set using this command.
  :CONFigure:CELLular:COMMon:TRXFrequency:FREQuency,
  :CONFigure:CELLular:COMMon:TRXFrequency:FREQuency2,
  :CONFigure:CELLular:COMMon:TRXFrequency:FREQuency3

Example of Use

With the output and input frequencies of sequence 0 set to 800 MHz and 900 MHz, respectively, to set both downlink frequency and uplink frequency of sequences 1 through 39 so that both uplink frequency and downlink frequency increment by +1 MHz through each of the sequences:

:CONF:CELL:COMM:TRXF:FREQ
800,900,801,901,802,902,803,903,804,904,805,905,806,906,807,907,808,908,809,909
:CONF:CELL:COMM:TRXF:FREQ?
>
800.0000,900.0000,801.0000,901.0000,802.0000,902.0000,803.0000,903.0000,804.0000,904.0000,805.0000,905.0000,806.0000,906.0000,807.0000,907.0000,808.0000,908.0000,809.0000,909.0000,…,1000.0000,2000.0000*
*: Actually, always returns 40 items even if not omitted.

:CONF:CELL:COMM:TRXF:FREQ2
810,910,811,911,812,912,813,913,814,914,815,915,816,916,817,917,818,918,819,919
:CONF:CELL:COMM:TRXF:FREQ2?
>
810.0000,910.0000,811.0000,911.0000,812.0000,912.0000,813.0000,913.0000,814.0000,914.0000,815.0000,915.0000,816.0000,916.0000,817.0000,917.0000,818.0000,918.0000,819.0000,919.0000

:CONF:CELL:COMM:TRXF:FREQ3
820,920,821,921,822,922,823,923,824,924,825,925,826,926,827,927,828,928,829,929
:CONF:CELL:COMM:TRXF:FREQ3?
>
820.0000,920.0000,821.0000,921.0000,822.0000,922.0000,823.0000,923.0000,824.0000,924.0000,825.0000,925.0000,826.0000,926.0000,827.0000,927.0000,828.0000,928.0000,829.0000,929.0000

:CONF:CELL:COMM:TRXF:FREQ4
830,930,831,931,832,932,833,933,834,934,835,935,836,936,837,937,838,938,839,939
:CONF:CELL:COMM:TRXF:FREQ4?
>
830.0000,930.0000,831.0000,931.0000,832.0000,932.0000,833.0000,933.0000,834.0000,934.0000,835.0000,935.0000,836.0000,936.0000,837.0000,937.0000,838.0000,938.0000,839.0000,939.0000

:CONFigure:CELLular:COMMon:TRXFrequency:FREQuency5

Tx/Rx vs. Frequency Measurement - Registration of Tx/Rx Frequency

Function

Sets or queries input/output RF signal frequency of sequences 40 to 49 at Tx/Rx vs. Frequency measurement. The command is used to set sequence 40 or above.

Command

```
:CONFigure:CELLular:COMMon:TRXFrequency:FREQuency5
<dlfreq(40)>,<ulfreq(40)>[,<dlfreq(41)>,<ulfreq(41)>[,…[,<dlfreq(49)>,<ul
freq(49)>]…]]
```

Query

```
:CONFigure:CELLular:COMMon:TRXFrequency:FREQuency5?
```

Response

<dlfreq(40)>,<ulfreq(40)>,<dlfreq(41)>,<ulfreq(41)>, ... ,<dlfreq(49)>,<ulfreq(49)>

Unit	MHz

Parameters

<dlfreq(n)>	Downlink frequency of sequence number n
Range	400.000000 to 6000.000000 MHz
Resolution	0.0001 MHz
Suffix Code	HZ, KHZ, KZ, MHZ, MZ, GHZ, GZ (uses MHz when omitted)
Default	1000 MHz
<ulfreq(n)>	Uplink frequency of sequence number n
Range	400.000000 to 6000.000000 MHz
Resolution	0.0001 MHz
Suffix Code	HZ, KHZ, KZ, MHZ, MZ, GHZ, GZ (uses MHz when omitted)
Default	2000 MHz

Details

- The parameter units are MHz. The dlfreq(n) and ulfreq(n) parameters are set as a pair without the units.
- The parameters for the sequence 41 and subsequent sequences can be omitted. In this case, the number of responses does not exceed the registered number of sequences.
- After setting the frequency of the sequences 0 through 39 using the following command, the frequency of the sequences 40 through 49 can be set using this command.

:CONFigure:CELLular:COMMon:TRXFrequency:FREQuency,
:CONFigure:CELLular:COMMon:TRXFrequency:FREQuency2,
:CONFigure:CELLular:COMMon:TRXFrequency:FREQuency3,
:CONFigure:CELLular:COMMon:TRXFrequency:FREQuency4

Example of Use

With the output and input frequencies of sequence 0 set to 800 MHz and 900 MHz, respectively, to set both downlink frequency and uplink frequency of sequences 1 through 49 so that both uplink frequency and downlink frequency increment by +1 MHz through each of the sequences:

:CONF:CELL:COMM:TRXF:FREQ
800,900,801,901,802,902,803,903,804,904,805,905,806,906,807,907,808,908,809,909
:CONF:CELL:COMM:TRXF:FREQ?
>
800.0000,900.0000,801.0000,901.0000,802.0000,902.0000,803.0000,903.0000,804.0000,904.000
0,805.0000,905.0000,806.0000,906.0000,807.0000,907.0000,808.0000,908.0000,809.0000,909.00
00,…,1000.0000,2000.0000*
*: Actually, always returns 40 items even if not omitted.

:CONF:CELL:COMM:TRXF:FREQ2
810,910,811,911,812,912,813,913,814,914,815,915,816,916,817,917,818,918,819,919
:CONF:CELL:COMM:TRXF:FREQ2?
>
810.0000,910.0000,811.0000,911.0000,812.0000,912.0000,813.0000,913.0000,814.0000,914.000
0,815.0000,915.0000,816.0000,916.0000,817.0000,917.0000,818.0000,918.0000,819.0000,919.00
00

:CONF:CELL:COMM:TRXF:FREQ3
820,920,821,921,822,922,823,923,824,924,825,925,826,926,827,927,828,928,829,929
:CONF:CELL:COMM:TRXF:FREQ3?
>
820.0000,920.0000,821.0000,921.0000,822.0000,922.0000,823.0000,923.0000,824.0000,924.000
0,825.0000,925.0000,826.0000,926.0000,827.0000,927.0000,828.0000,928.0000,829.0000,929.00
00

…

:CONF:CELL:COMM:TRXF:FREQ5
840,940,841,941,842,942,843,943,844,944,845,945,846,946,847,947,848,948,849,949
:CONF:CELL:COMM:TRXF:FREQ5?
>
840.0000,940.0000,841.0000,941.0000,842.0000,942.0000,843.0000,943.0000,844.0000,944.000
0,845.0000,945.0000,846.0000,946.0000,847.0000,947.0000,848.0000,948.0000,849.0000,949.00
00

:CONFigure:CELLular:COMMon:TRXFrequency:FREQuency6

Tx/Rx vs. Frequency Measurement - Registration of Tx/Rx Frequency

Function

Sets or queries input/output RF signal frequency of sequences 50 to 59 at Tx/Rx vs. Frequency measurement. The command is used to set sequence 50 or above.

Command

```
:CONFigure:CELLular:COMMon:TRXFrequency:FREQuency6
<dlfreq(50)>,<ulfreq(50)>[,<dlfreq(51)>,<ulfreq(51)>[,…[,<dlfreq(59)>,<ul
freq(59)>]…]]
```

Query

```
:CONFigure:CELLular:COMMon:TRXFrequency:FREQuency6?
```

Response

<dlfreq(50)>,<ulfreq(50)>,<dlfreq(51)>,<ulfreq(51)>, ... ,<dlfreq(59)>,<ulfreq(59)>

Unit	MHz

Parameters

<dlfreq(n)>	Downlink frequency of sequence number n
Range	400.000000 to 6000.000000 MHz
Resolution	0.0001 MHz
Suffix Code	HZ, KHZ, KZ, MHZ, MZ, GHZ, GZ (uses MHz when omitted)
Default	1000 MHz
<ulfreq(n)>	Uplink frequency of sequence number n
Range	400.000000 to 6000.000000 MHz
Resolution	0.0001 MHz
Suffix Code	HZ, KHZ, KZ, MHZ, MZ, GHZ, GZ (uses MHz when omitted)
Default	2000 MHz

Details

- The parameter units are MHz. The dlfreq(n) and ulfreq(n) parameters are set as a pair without the units.
- The parameters for the sequence 51 and subsequent sequences can be omitted. In this case, the number of responses does not exceed the registered number of sequences.
- After setting the frequency of the sequences 0 through 49 using the following command, the frequency of the sequences 50 through 59 can be set using this command.
  :CONFigure:CELLular:COMMon:TRXFrequency:FREQuency,
  :CONFigure:CELLular:COMMon:TRXFrequency:FREQuency2,
  :CONFigure:CELLular:COMMon:TRXFrequency:FREQuency3,

…

:CONFigure:CELLular:COMMon:TRXFrequency:FREQuency5

Example of Use

With the output and input frequencies of sequence 0 set to 800 MHz and 900 MHz, respectively, to set both downlink frequency and uplink frequency of sequences 1 through 59 so that both uplink frequency and downlink frequency increment by +1 MHz through each of the sequences:

:CONF:CELL:COMM:TRXF:FREQ
800,900,801,901,802,902,803,903,804,904,805,905,806,906,807,907,808,908,809,909
:CONF:CELL:COMM:TRXF:FREQ?
>
800.0000,900.0000,801.0000,901.0000,802.0000,902.0000,803.0000,903.0000,804.0000,904.0000,805.0000,905.0000,806.0000,906.0000,807.0000,907.0000,808.0000,908.0000,809.0000,909.0000,…,1000.0000,2000.0000*
*: Actually, always returns 40 items even if not omitted.

:CONF:CELL:COMM:TRXF:FREQ2
810,910,811,911,812,912,813,913,814,914,815,915,816,916,817,917,818,918,819,919
:CONF:CELL:COMM:TRXF:FREQ2?
>
810.0000,910.0000,811.0000,911.0000,812.0000,912.0000,813.0000,913.0000,814.0000,914.0000,815.0000,915.0000,816.0000,916.0000,817.0000,917.0000,818.0000,918.0000,819.0000,919.0000

:CONF:CELL:COMM:TRXF:FREQ3
820,920,821,921,822,922,823,923,824,924,825,925,826,926,827,927,828,928,829,929
:CONF:CELL:COMM:TRXF:FREQ3?
>
820.0000,920.0000,821.0000,921.0000,822.0000,922.0000,823.0000,923.0000,824.0000,924.0000,825.0000,925.0000,826.0000,926.0000,827.0000,927.0000,828.0000,928.0000,829.0000,929.0000

…

:CONF:CELL:COMM:TRXF:FREQ6
850,950,851,951,852,952,853,953,854,954,855,955,856,956,857,957,858,958,859,959
:CONF:CELL:COMM:TRXF:FREQ6?
>
850.0000,950.0000,851.0000,951.0000,852.0000,952.0000,853.0000,953.0000,854.0000,954.0000,855.0000,955.0000,856.0000,956.0000,857.0000,957.0000,858.0000,958.0000,859.0000,959.0000

:CONFigure:CELLular:COMMon:TRXFrequency:FREQuency7

Tx/Rx vs. Frequency Measurement - Registration of Tx/Rx Frequency

Function

Sets or queries input/output RF signal frequency of sequences 60 to 69 at Tx/Rx vs. Frequency measurement. The command is used to set sequence 60 or above.

Command

```
:CONFigure:CELLular:COMMon:TRXFrequency:FREQuency7
<dlfreq(60)>,<ulfreq(60)>[,<dlfreq(61)>,<ulfreq(61)>[,…[,<dlfreq(69)>,<ul
freq(69)>]…]]
```

Query

```
:CONFigure:CELLular:COMMon:TRXFrequency:FREQuency7?
```

Response

<dlfreq(60)>,<ulfreq(60)>,<dlfreq(61)>,<ulfreq(61)>, … ,<dlfreq(69)>,<ulfreq(69)>

Unit	MHz

Parameters

<dlfreq(n)>	Downlink frequency of sequence number n
Range	400.000000 to 6000.000000 MHz
Resolution	0.0001 MHz
Suffix Code	HZ, KHZ, KZ, MHZ, MZ, GHZ, GZ (uses MHz when omitted)
Default	1000 MHz
<ulfreq(n)>	Uplink frequency of sequence number n
Range	400.000000 to 6000.000000 MHz
Resolution	0.0001 MHz
Suffix Code	HZ, KHZ, KZ, MHZ, MZ, GHZ, GZ (uses MHz when omitted)
Default	2000 MHz

Details

- The parameter units are MHz. The dlfreq(n) and ulfreq(n) parameters are set as a pair without the units.
- The parameters for the sequence 61 and subsequent sequences can be omitted. In this case, the number of responses does not exceed the registered number of sequences.
- After setting the frequency of the sequences 0 through 59 using the following command, the frequency of the sequences 60 through 69 can be set using this command.
  :CONFigure:CELLular:COMMon:TRXFrequency:FREQuency,
  :CONFigure:CELLular:COMMon:TRXFrequency:FREQuency2,
  :CONFigure:CELLular:COMMon:TRXFrequency:FREQuency3,
  …

:CONFigure:CELLular:COMMon:TRXFrequency:FREQuency6

Example of Use

With the output and input frequencies of sequence 0 set to 800 MHz and 900 MHz, respectively, to set both downlink frequency and uplink frequency of sequences 1 through 69 so that both uplink frequency and downlink frequency increment by +1 MHz through each of the sequences:

:CONF:CELL:COMM:TRXF:FREQ
800,900,801,901,802,902,803,903,804,904,805,905,806,906,807,907,808,908,809,909
:CONF:CELL:COMM:TRXF:FREQ?
>
800.0000,900.0000,801.0000,901.0000,802.0000,902.0000,803.0000,903.0000,804.0000,904.000
0,805.0000,905.0000,806.0000,906.0000,807.0000,907.0000,808.0000,908.0000,809.0000,909.00
00,…,1000.0000,2000.0000*
*: Actually, always returns 40 items even if not omitted.

:CONF:CELL:COMM:TRXF:FREQ2
810,910,811,911,812,912,813,913,814,914,815,915,816,916,817,917,818,918,819,919
:CONF:CELL:COMM:TRXF:FREQ2?
>
810.0000,910.0000,811.0000,911.0000,812.0000,912.0000,813.0000,913.0000,814.0000,914.000
0,815.0000,915.0000,816.0000,916.0000,817.0000,917.0000,818.0000,918.0000,819.0000,919.00
00

:CONF:CELL:COMM:TRXF:FREQ3
820,920,821,921,822,922,823,923,824,924,825,925,826,926,827,927,828,928,829,929
:CONF:CELL:COMM:TRXF:FREQ3?
>
820.0000,920.0000,821.0000,921.0000,822.0000,922.0000,823.0000,923.0000,824.0000,924.000
0,825.0000,925.0000,826.0000,926.0000,827.0000,927.0000,828.0000,928.0000,829.0000,929.00
00

…

:CONF:CELL:COMM:TRXF:FREQ7
860,960,861,961,862,962,863,963,864,964,865,965,866,966,867,967,868,968,869,969
:CONF:CELL:COMM:TRXF:FREQ7?
>
860.0000,960.0000,861.0000,961.0000,862.0000,962.0000,863.0000,963.0000,864.0000,964.000
0,865.0000,965.0000,866.0000,966.0000,867.0000,967.0000,868.0000,968.0000,869.0000,969.00
00

:CONFigure:CELLular:COMMon:TRXFrequency:FREQuency8

Tx/Rx vs. Frequency Measurement - Registration of Tx/Rx Frequency

Function

Sets or queries input/output RF signal frequency of sequences 70 to 79 at Tx/Rx vs. Frequency measurement. The command is used to set sequence 70 or above.

Command

```
:CONFigure:CELLular:COMMon:TRXFrequency:FREQuency8
<dlfreq(70)>,<ulfreq(70)>[,<dlfreq(71)>,<ulfreq(71)>[,…[,<dlfreq(79)>,<ul
freq(79)>]…]]
```

Query

```
:CONFigure:CELLular:COMMon:TRXFrequency:FREQuency8?
```

Response

<dlfreq(70)>,<ulfreq(70)>,<dlfreq(71)>,<ulfreq(71)>, … ,<dlfreq(79)>,<ulfreq(79)>

Unit	MHz

Parameters

<dlfreq(n)>	Downlink frequency of sequence number n
Range	400.000000 to 6000.000000 MHz
Resolution	0.0001 MHz
Suffix Code	HZ, KHZ, KZ, MHZ, MZ, GHZ, GZ (uses MHz when omitted)
Default	1000 MHz
<ulfreq(n)>	Uplink frequency of sequence number n
Range	400.000000 to 6000.000000 MHz
Resolution	0.0001 MHz
Suffix Code	HZ, KHZ, KZ, MHZ, MZ, GHZ, GZ (uses MHz when omitted)
Default	2000 MHz

Details

- The parameter units are MHz. The dlfreq(n) and ulfreq(n) parameters are set as a pair without the units.
- The parameters for the sequence 71 and subsequent sequences can be omitted. In this case, the number of responses does not exceed the registered number of sequences
- After setting the frequency of the sequences 0 through 69 using the following command, the frequency of the sequences 70 through 79 can be set using this command.
  :CONFigure:CELLular:COMMon:TRXFrequency:FREQuency,
  :CONFigure:CELLular:COMMon:TRXFrequency:FREQuency2,
  :CONFigure:CELLular:COMMon:TRXFrequency:FREQuency3,
  …

:CONFigure:CELLular:COMMon:TRXFrequency:FREQuency7

Example of Use

With the output and input frequencies of sequence 0 set to 800 MHz and 900 MHz, respectively, to set both downlink frequency and uplink frequency of sequences 1 through 79 so that both uplink frequency and downlink frequency increment by +1 MHz through each of the sequences:

:CONF:CELL:COMM:TRXF:FREQ
800,900,801,901,802,902,803,903,804,904,805,905,806,906,807,907,808,908,809,909
:CONF:CELL:COMM:TRXF:FREQ?
>
800.0000,900.0000,801.0000,901.0000,802.0000,902.0000,803.0000,903.0000,804.0000,904.000
0,805.0000,905.0000,806.0000,906.0000,807.0000,907.0000,808.0000,908.0000,809.0000,909.00
00, …,1000.0000,2000.0000*
*: Actually, always returns 40 items even if not omitted.

:CONF:CELL:COMM:TRXF:FREQ2
810,910,811,911,812,912,813,913,814,914,815,915,816,916,817,917,818,918,819,919
:CONF:CELL:COMM:TRXF:FREQ2?
>
810.0000,910.0000,811.0000,911.0000,812.0000,912.0000,813.0000,913.0000,814.0000,914.000
0,815.0000,915.0000,816.0000,916.0000,817.0000,917.0000,818.0000,918.0000,819.0000,919.00
00

:CONF:CELL:COMM:TRXF:FREQ3
820,920,821,921,822,922,823,923,824,924,825,925,826,926,827,927,828,928,829,929
:CONF:CELL:COMM:TRXF:FREQ3?
>
820.0000,920.0000,821.0000,921.0000,822.0000,922.0000,823.0000,923.0000,824.0000,924.000
0,825.0000,925.0000,826.0000,926.0000,827.0000,927.0000,828.0000,928.0000,829.0000,929.00
00

…

:CONF:CELL:COMM:TRXF:FREQ8
870,970,871,971,872,972,873,973,874,974,875,975,876,976,877,977,878,978,879,979
:CONF:CELL:COMM:TRXF:FREQ8?
>
870.0000,970.0000,871.0000,971.0000,872.0000,972.0000,873.0000,973.0000,874.0000,974.000
0,875.0000,975.0000,876.0000,976.0000,877.0000,977.0000,878.0000,978.0000,879.0000,979.00
00

:CONFigure:CELLular:COMMon:TRXFrequency:FREQuency9

Tx/Rx vs. Frequency Measurement - Registration of Tx/Rx Frequency

Function

Sets or queries input/output RF signal frequency of sequences 80 to 89 at Tx/Rx vs. Frequency measurement. The command is used to set sequence 80 or above.

Command

```
:CONFigure:CELLular:COMMon:TRXFrequency:FREQuency9
<dlfreq(80)>,<ulfreq(80)>[,<dlfreq(81)>,<ulfreq(81)>[,…[,<dlfreq(89)>,<ul
freq(89)>]…]]
```

Query

```
:CONFigure:CELLular:COMMon:TRXFrequency:FREQuency9?
```

Response

<dlfreq(80)>,<ulfreq(80)>,<dlfreq(81)>,<ulfreq(81)>, … ,<dlfreq(89)>,<ulfreq(89)>

Unit	MHz

Parameters

<dlfreq(n)>	Downlink frequency of sequence number n
Range	400.000000 to 6000.000000 MHz
Resolution	0.0001 MHz
Suffix Code	HZ, KHZ, KZ, MHZ, MZ, GHZ, GZ (uses MHz when omitted)
Default	1000 MHz
<ulfreq(n)>	Uplink frequency of sequence number n
Range	400.000000 to 6000.000000 MHz
Resolution	0.0001 MHz
Suffix Code	HZ, KHZ, KZ, MHZ, MZ, GHZ, GZ (uses MHz when omitted)
Default	2000 MHz

Details

- The parameter units are MHz. The dlfreq(n) and ulfreq(n) parameters are set as a pair without the units.
- The parameters for the sequence 81 and subsequent sequences can be omitted. In this case, the number of responses does not exceed the registered number of sequences.
- After setting the frequency of the sequences 0 through 79 using the following command, the frequency of the sequences 80 through 89 can be set using this command.
  :CONFigure:CELLular:COMMon:TRXFrequency:FREQuency,
  :CONFigure:CELLular:COMMon:TRXFrequency:FREQuency2,
  :CONFigure:CELLular:COMMon:TRXFrequency:FREQuency3,

  …

:CONFigure:CELLular:COMMon:TRXFrequency:FREQuency8

Example of Use

With the output and input frequencies of sequence 0 set to 800 MHz and 900 MHz, respectively, to set both downlink frequency and uplink frequency of sequences 1 through 89 so that both uplink frequency and downlink frequency increment by +1 MHz through each of the sequences:

:CONF:CELL:COMM:TRXF:FREQ
800,900,801,901,802,902,803,903,804,904,805,905,806,906,807,907,808,908,809,909
:CONF:CELL:COMM:TRXF:FREQ?
>
800.0000,900.0000,801.0000,901.0000,802.0000,902.0000,803.0000,903.0000,804.0000,904.000
0,805.0000,905.0000,806.0000,906.0000,807.0000,907.0000,808.0000,908.0000,809.0000,909.00
00, …,1000.0000,2000.0000*
*: Actually, always returns 40 items even if not omitted.

:CONF:CELL:COMM:TRXF:FREQ2
810,910,811,911,812,912,813,913,814,914,815,915,816,916,817,917,818,918,819,919
:CONF:CELL:COMM:TRXF:FREQ2?
>
810.0000,910.0000,811.0000,911.0000,812.0000,912.0000,813.0000,913.0000,814.0000,914.000
0,815.0000,915.0000,816.0000,916.0000,817.0000,917.0000,818.0000,918.0000,819.0000,919.00
00

:CONF:CELL:COMM:TRXF:FREQ3
820,920,821,921,822,922,823,923,824,924,825,925,826,926,827,927,828,928,829,929
:CONF:CELL:COMM:TRXF:FREQ3?
>
820.0000,920.0000,821.0000,921.0000,822.0000,922.0000,823.0000,923.0000,824.0000,924.000
0,825.0000,925.0000,826.0000,926.0000,827.0000,927.0000,828.0000,928.0000,829.0000,929.00
00

…

:CONF:CELL:COMM:TRXF:FREQ9
880,980,881,981,882,982,883,983,884,984,885,985,886,986,887,987,888,988,889,989
:CONF:CELL:COMM:TRXF:FREQ9?
>
880.0000,980.0000,881.0000,981.0000,882.0000,982.0000,883.0000,983.0000,884.0000,984.000
0,885.0000,985.0000,886.0000,986.0000,887.0000,987.0000,888.0000,988.0000,889.0000,989.00
00

:CONFigure:CELLular:COMMon:TRXFrequency:FREQuency10

Tx/Rx vs. Frequency Measurement - Registration of Tx/Rx Frequency

Function

Sets or queries input/output RF signal frequency of sequences 90 to 99 at Tx/Rx vs. Frequency measurement. The command is used to set sequence 90 or above.

Command

```
:CONFigure:CELLular:COMMon:TRXFrequency:FREQuency10
<dlfreq(90)>,<ulfreq(90)>[,<dlfreq(91)>,<ulfreq(91)>[,…[,<dlfreq(99)>,<ul
freq(99)>]…]]
```

Query

```
:CONFigure:CELLular:COMMon:TRXFrequency:FREQuency10?
```

Response

<dlfreq(90)>,<ulfreq(90)>,<dlfreq(91)>,<ulfreq(91)>, … ,<dlfreq(99)>,<ulfreq(99)>

Unit	MHz

Parameters

<dlfreq(n)>	Downlink frequency of sequence number n
Range	400.000000 to 6000.000000 MHz
Resolution	0.0001 MHz
Suffix Code	HZ, KHZ, KZ, MHZ, MZ, GHZ, GZ (uses MHz when omitted)
Default	1000 MHz
<ulfreq(n)>	Uplink frequency of sequence number n
Range	400.000000 to 6000.000000 MHz
Resolution	0.0001 MHz
Suffix Code	HZ, KHZ, KZ, MHZ, MZ, GHZ, GZ (uses MHz when omitted)
Default	2000 MHz

Details

- The parameter units are MHz. The dlfreq(n) and ulfreq(n) parameters are set as a pair without the units.
- The parameters for the sequence 91 and subsequent sequences can be omitted. In this case, the number of responses does not exceed the registered number of sequences.
- After setting the frequency of the sequences 0 through 89 using the following command, the frequency of the sequences 90 through 99 can be set using this command.
  :CONFigure:CELLular:COMMon:TRXFrequency:FREQuency,
  :CONFigure:CELLular:COMMon:TRXFrequency:FREQuency2,
  :CONFigure:CELLular:COMMon:TRXFrequency:FREQuency3,
  …

:CONFigure:CELLular:COMMon:TRXFrequency:FREQuency9

Example of Use

With the output and input frequencies of sequence 0 set to 800 MHz and 900 MHz, respectively, to set both downlink frequency and uplink frequency of sequences 1 through 99 so that both uplink frequency and downlink frequency increment by +1 MHz through each of the sequences:

:CONF:CELL:COMM:TRXF:FREQ
800,900,801,901,802,902,803,903,804,904,805,905,806,906,807,907,808,908,809,909
:CONF:CELL:COMM:TRXF:FREQ?
>
800.0000,900.0000,801.0000,901.0000,802.0000,902.0000,803.0000,903.0000,804.0000,904.000
0,805.0000,905.0000,806.0000,906.0000,807.0000,907.0000,808.0000,908.0000,809.0000,909.00
00,…,1000.0000,2000.0000*
*: Actually, always returns 40 items even if not omitted.

:CONF:CELL:COMM:TRXF:FREQ2
810,910,811,911,812,912,813,913,814,914,815,915,816,916,817,917,818,918,819,919
:CONF:CELL:COMM:TRXF:FREQ2?
>
810.0000,910.0000,811.0000,911.0000,812.0000,912.0000,813.0000,913.0000,814.0000,914.000
0,815.0000,915.0000,816.0000,916.0000,817.0000,917.0000,818.0000,918.0000,819.0000,919.00
00

:CONF:CELL:COMM:TRXF:FREQ3
820,920,821,921,822,922,823,923,824,924,825,925,826,926,827,927,828,928,829,929
:CONF:CELL:COMM:TRXF:FREQ3?
>
820.0000,920.0000,821.0000,921.0000,822.0000,922.0000,823.0000,923.0000,824.0000,924.000
0,825.0000,925.0000,826.0000,926.0000,827.0000,927.0000,828.0000,928.0000,829.0000,929.00
00

…

:CONF:CELL:COMM:TRXF:FREQ10
890,990,891,991,892,992,893,993,894,994,895,995,896,996,897,997,898,998,899,999
:CONF:CELL:COMM:TRXF:FREQ10?
>
890.0000,990.0000,891.0000,991.0000,892.0000,992.0000,893.0000,993.0000,894.0000,994.000
0,895.0000,995.0000,896.0000,996.0000,897.0000,997.0000,898.0000,998.0000,899.0000,999.00
00

:CONFigure:CELLular:COMMon:TRXFrequency:FREQuency11 to :CONFigure:CELLular:COMMon:TRXFrequency:FREQuency40

Tx/Rx vs. Frequency Measurement - Registration of Tx/Rx Frequency

Function

Sets or queries the input/output RF signal frequencies of the sequences 100 through 109, 110 through 119, …, and 390 through 399 at the Tx/Rx vs. Frequency measurement. The command is used to set sequence 100 or above.

Command

```
:CONFigure:CELLular:COMMon:TRXFrequency:FREQuency11
<dlfreq(100)>,<ulfreq(100)>[,<dlfreq(101)>,<ulfreq(101)>[,…[,<dlfreq(109)
>,<ulfreq(109)>]…]]

:CONFigure:CELLular:COMMon:TRXFrequency:FREQuency12
<dlfreq(110)>,<ulfreq(110)>[,<dlfreq(111)>,<ulfreq(111)>[,…[,<dlfreq(119)
>,<ulfreq(119)>]…]]

…

:CONFigure:CELLular:COMMon:TRXFrequency:FREQuency40
<dlfreq(390)>,<ulfreq(390)>[,<dlfreq(391)>,<ulfreq(391)>[,…[,<dlfreq(399)
>,<ulfreq(399)>]…]]
```

Query

```
:CONFigure:CELLular:COMMon:TRXFrequency:FREQuency11?
:CONFigure:CELLular:COMMon:TRXFrequency:FREQuency12?
…
:CONFigure:CELLular:COMMon:TRXFrequency:FREQuency40?
```

Response

<dlfreq(100)>,<ulfreq(100)>,<dlfreq(101)>,<ulfreq(101)>, … ,<dlfreq(109)>,<ulfreq(109)>
<dlfreq(110)>,<ulfreq(110)>,<dlfreq(111)>,<ulfreq(111)>, … ,<dlfreq(119)>,<ulfreq(119)>
…
<dlfreq(390)>,<ulfreq(390)>,<dlfreq(391)>,<ulfreq(391)>, … ,<dlfreq(399)>,<ulfreq(399)>

Unit	MHz

Parameters

<dlfreq(n)>	Downlink frequency of sequence number n
Range	400.000000 to 6000.000000 MHz
Resolution	0.0001 MHz

Suffix code	HZ, KHZ, KZ, MHZ, MZ, GHZ, GZ
	MHz when omitted
Default	1000 MHz
<ulfreq(n)>	Uplink frequency of sequence number n
Range	400.000000 to 6000.000000 MHz
Resolution	0.0001 MHz
Suffix code	HZ, KHZ, KZ, MHZ, MZ, GHZ, GZ
	MHz when omitted
Default	2000 MHz

Details

- The parameter units are MHz. The dlfreq(n) and ulfreq(n) parameters are set as a pair without the units.
- The parameters for the sequences 101, 111, ... , and 391 and subsequent sequences can be omitted. In this case, the number of responses does not exceed the registered number of sequences.
- After setting the frequency of the sequences 0 through 99, 109, …, and 389 using the following commands, the frequency of the sequences 100 through 109, 110 through 119, …, and 390 through 399 can be set using this command.

:CONFigure:CELLular:COMMon:TRXFrequency:FREQuency,
:CONFigure:CELLular:COMMon:TRXFrequency:FREQuency2,
:CONFigure:CELLular:COMMon:TRXFrequency:FREQuency3,
…
:CONFigure:CELLular:COMMon:TRXFrequency:FREQuency9,
:CONFigure:CELLular:COMMon:TRXFrequency:FREQuency10,
…
:CONFigure:CELLular:COMMon:TRXFrequency:FREQuency39

Example of Use

To set the output frequency and input frequencies of the sequence 0 to 800 MHz and 900 MHz respectively. Perform the setting so that the downlink and uplink frequencies increment by 1 MHz per sequence from the sequence 1 through 99.

:CONF:CELL:COMM:TRXF:FREQ
800,900,801,901,802,902,803,903,804,904,805,905,806,906,807,907,808,908,809,909
:CONF:CELL:COMM:TRXF:FREQ?
>
800.0000,900.0000,801.0000,901.0000,802.0000,902.0000,803.0000,903.0000,804.0000,904.000
0,805.0000,905.0000,806.0000,906.0000,807.0000,907.0000,808.0000,908.0000,809.0000,909.00
00, …,1000.0000,2000.0000*

*: Actually, always returns 40 items even if not omitted.

:CONF:CELL:COMM:TRXF:FREQ2
810,910,811,911,812,912,813,913,814,914,815,915,816,916,817,917,818,918,819,919
:CONF:CELL:COMM:TRXF:FREQ2?

```
>
810.0000,910.0000,811.0000,911.0000,812.0000,912.0000,813.0000,913.0000,814.0000,914.000
0,815.0000,915.0000,816.0000,916.0000,817.0000,917.0000,818.0000,918.0000,819.0000,919.00
00

:CONF:CELL:COMM:TRXF:FREQ3
820,920,821,921,822,922,823,923,824,924,825,925,826,926,827,927,828,928,829,929
:CONF:CELL:COMM:TRXF:FREQ3?
>
820.0000,920.0000,821.0000,921.0000,822.0000,922.0000,823.0000,923.0000,824.0000,924.000
0,825.0000,925.0000,826.0000,926.0000,827.0000,927.0000,828.0000,928.0000,829.0000,929.00
00

…

:CONF:CELL:COMM:TRXF:FREQ10
890,990,891,991,892,992,893,993,894,994,895,995,896,996,897,997,898,998,899,999
:CONF:CELL:COMM:TRXF:FREQ10?
>
890.0000,990.0000,891.0000,991.0000,892.0000,992.0000,893.0000,993.0000,894.0000,994.000
0,895.0000,995.0000,896.0000,996.0000,897.0000,997.0000,898.0000,998.0000,899.0000,999.00
00
```

:CONFigure:CELLular:COMMon:TRXFrequency:IROutput

Tx/Rx vs Frequency Measurement - Invalid Result Output

Function

Sets whether measurement results of invalid measurement intervals at Tx/Rx vs. Frequency measurement output as invalid value or numeric value

Command

```
:CONFigure:CELLular:COMMon:TRXFrequency:IROutput <on_off>
```

Query

```
:CONFigure:CELLular:COMMon:TRXFrequency:IROutput?
```

Response

<on_off>

Parameter

<on_off>	Display method for invalid measurement results
ON	Display numeric values
OFF	Display invalid value (999.99)
Default	OFF

Details

Power is not measured correctly when the level of a slot with set input level changes. In this case, this command sets the measurement results display. When the ON parameter is set, the actual invalid measurement result value is output as is.

When the OFF parameter is set, the measurement result is displayed as 999.99, indicating that the measurement is invalid.

Example of Use

To display 999.99 as measurement result for invalid slot:

:CONF:CELL:COMM:TRXF:IRO OFF

:CONF:CELL:COMM:TRXF:IRO?

> OFF

:CONFigure:CELLular:COMMon:TRXFrequency:PERiod

Tx/Rx vs Frequency Measurement - Measurement Window Offset & Measurement Window

Function

Sets or queries offset and measurement window at Tx/Rx vs. Frequency measurement

Command

```
:CONFigure:CELLular:COMMon:TRXFrequency:PERiod <offset>,<meas_window>
```

Query

```
:CONFigure:CELLular:COMMon:TRXFrequency:PERiod?
```

Response

<offset>,<meas_window>

Unit	%

Parameters

<offset>	Offset
Range	0 to 75%
Resolution	1%
Default	25%
<meas_window>	Measurement window
Range	1 to 90%
Resolution	1%
Default	55%

Details

Set the measurement window and offset as a proportional ratio (%) to the step duration.
Set the offset and measurement interval so that the total is less than 100%.

Example of Use

To set the offset of the measurement interval to 10% and the measurement interval ratio to 80%:

:CONF:CELL:COMM:TRXF:PER 10,80

:CONF:CELL:COMM:TRXF:PER?

> 10,80

:CONFigure:CELLular:COMMon:TRXFrequency:RXLevel

Tx/Rx vs Frequency Measurement - Registration of Mobile Rx Power

Function

Sets or queries output RF signal level at each segment at Tx/Rx vs. Frequency measurement

Command

```
:CONFigure:CELLular:COMMon:TRXFrequency:RXLevel
<p(0)>[,<p(1)>[,…[,<p(71)>]…]]
```

Query

```
:CONFigure:CELLular:COMMon:TRXFrequency:RXLevel?
```

Response

<p(0)>,<p(1)>,...,<p(71)>

Unit	dBm

Parameter

<p(n)>	RF signal output level of segment n (downlink)
Range	–130.0 to –10.0 dBm (Port1/Port2)
	–120.0 to 0.0 dBm (Port3/Port4)
Resolution	0.1 dB
Suffix Code	DBM (uses dBm when omitted)
Default	–120.0 dBm

Details

- Parameters in segment 1 and subsequent segments can be omitted. In this case the number of responses does not exceed the number of segments registered.
- After setting the input/output frequency in each sequence, the output level can be set using this command.
- If cable loss correction is set to ON, subtract the cable loss from the setting range of the output level.

  If the cable loss is 5 dB, use the setting range from –135.0 to –5.0 dB.

  In this case, if the parameter is set to 0.0 dBm, an "out of parameter setting range" error occurs. (The response to:SYSTem:ERRor? returns 220, "Parameter error".)

  Sending :INITiate:CELLular:MEASurement:SINGle queries whether the configured level is within the parameter setting range.

Example of Use

To set the output levels of segment 0 and segment 1 to –80 dBm and –90 dBm, respectively:

:CONF:CELL:COMM:TRXF:RXL -80, -90

:CONF:CELL:COMM:TRXF:RXL?

> -80.0,-90.0,-120.0,…,-120.0,-120.0*

*: Actually, always returns 72 items even if not omitted.

:CONFigure:CELLular:COMMon:TRXFrequency:RXLevel2

Tx/Rx vs Frequency Measurement - Registration of Mobile Rx Power

Function

Sets or queries output RF signal level of each segment at Tx/Rx vs. Frequency measurement
The command is used to set segment 36 or above.

Command

```
:CONFigure:CELLular:COMMon:TRXFrequency:RXLevel2
<p(36)>[,<p(37)>[,…[,<p(71)>]…]]
```

Query

```
:CONFigure:CELLular:COMMon:TRXFrequency:RXLevel2?
```

Response

<p(36)>,<p(37)>,...,<p(71)>

Unit	dBm

Parameter

<p(n)>	RF signal output level of segment n
Range	–130.0 to –10.0 dBm (Port1/Port2) –120.0 to 0.0 dBm (Port3/Port4)
Resolution	0.1 dB
Suffix Code	DBM (uses dBm when omitted)
Default	–120.0 dBm

Details

- Parameters in segment 37 and subsequent segments can be omitted. In this case, the number of responses does not exceed the number of segments registered.
- After setting the output levels of segments 0 through 35 using :CONFigure:CELLular:COMMon:TRXFrequency:RXLevel, the output levels of segments 36 through 71 can be set using this command.
- After setting the input/output frequency in each sequence, the output level can be set using this command.
- If cable loss correction is set to ON, subtract the cable loss from the setting range of the output level.
  If the cable loss is 5 dB, use the setting range from –135.0 to –5.0 dB.
  In this case, if the parameter is set to 0.0 dBm, an "out of parameter setting range" error occurs. (The response to :SYSTem:ERRor? returns 220, "Parameter error".)
  Sending :INITiate:CELLular:MEASurement:SINGle queries whether the configured level is within the parameter setting range.

Example of Use

With the output level of segment 0 set to –60 dBm, to set the output levels of segments up to segment 38 so that the output levels decrement by –1 MHz through each of the segments:

:CONF:CELL:COMM:TRXF:RXL

-60,-61,-62,-63,-64,-65,-66,-67,-68,-69,-70,-71,-72,-73,-74,-75,-76,-77,-78,-79,-80,-81,-82,-83,-84,-85,-86,-87,-88,-89,-90,-91,-92,-93,-94,-95

:CONF:CELL:COMM:TRXF:RXL?

>

-60,-61,-62,-63,-64,-65,-66,-67,-68,-69,-70,-71,-72,-73,-74,-75,-76,-77,-78,-79,-80,-81,-82,-83,-84,-85,-86,-87,-88,-89,-90,-91,-92,-93,-94,-95,…,-120.0,-120.0*

*: Actually, always returns 72 items even if not omitted.

:CONF:CELL:COMM:TRXF:RXL2 -96,-97,-98

:CONF:CELL:COMM:TRXF:RXL2?

> -96.0,-97.0,-98.0,…,-120.0,-120.0*

*: Actually, always returns 36 items even if not omitted.

:CONFigure:CELLular:COMMon:TRXFrequency:SEGMent:DURation

Tx/Rx vs Frequency Measurement - Segment Duration

Function

Sets or queries segment duration at Tx/Rx vs. Frequency measurement

Command

```
:CONFigure:CELLular:COMMon:TRXFrequency:SEGMent:DURation <duration>
```

Query

```
:CONFigure:CELLular:COMMon:TRXFrequency:SEGMent:DURation?
```

Response

<duration>

Parameter

<duration>	Segment duration
Range	1 to 80 ms, WCDMA, CDMA2K, LTE
Resolution	1 ms
Default	20 ms

Details

If one of the standards is specified for the parameter, the segment duration is:
WCDMA: (10/15) ms, CDMA2K: 1.25 ms, LTE; 0.5 ms

Example of Use

To set the segment duration to 10 ms:
:CONF:CELL:COMM:TRXF:SEGM:DUR 10
:CONF:CELL:COMM:TRXF:SEGM:DUR?
> 10

:CONFigure:CELLular:COMMon:TRXFrequency:SEGMent:NUMBer

Tx/Rx vs Frequency Measurement - Segment Number

Function

Sets or queries number of segments at Tx/Rx vs. Frequency measurement

Command

```
:CONFigure:CELLular:COMMon:TRXFrequency:SEGMent:NUMBer <seg>
```

Query

```
:CONFigure:CELLular:COMMon:TRXFrequency:SEGMent:NUMBer?
```

Response

<seg>

Parameter

<seg>	Number of segments
Range	2 to 1600
Resolution	1
Default	2

Details

Set the parameter so that the product of the segment count and sequence count does not exceed 6400.

Example of Use

To set the number of segments to 10:

:CONF:CELL:COMM:TRXF:SEGM:NUM 10

:CONF:CELL:COMM:TRXF:SEGM:NUM?

> 10

:CONFigure:CELLular:COMMon:TRXFrequency:SEQuence:NUMBer

Tx/Rx vs Frequency Measurement - Sequence Number

Function

Sets or queries number of sequences at Tx/Rx vs. Frequency measurement

Command

```
:CONFigure:CELLular:COMMon:TRXFrequency:SEQuence:NUMBer <seq>
```

Query

```
:CONFigure:CELLular:COMMon:TRXFrequency:SEQuence:NUMBer?
```

Response

<seq>

Parameter

<seq>	Number of sequences
Range	1 to 100
Resolution	1
Default	1

Details

Set the parameter so that the product of the segment count and sequence count does not exceed 6400.

Example of Use

To set the number of sequences to 10:
:CONF:CELL:COMM:TRXF:SEQ:NUMB 10
:CONF:CELL:COMM:TRXF:SEQ:NUMB?
> 10

:CONFigure:CELLular:COMMon:TRXFrequency:TXRef

Tx/Rx vs Frequency Measurement - Input Level Control

Function

Sets or queries input level control at Tx/Rx vs. Frequency measurement

Command

```
:CONFigure:CELLular:COMMon:TRXFrequency:TXRef
<s>[,<ref(0)>[,<n(1)>,<ref(1)>[,…[,<n(99)>,<ref(99)>]…]]]
```

Query

```
:CONFigure:CELLular:COMMon:TRXFrequency:TXRef?
```

Response

<s>,<ref(0)>,<n(1)>,<ref(1)>,<n(2)>,<ref(2)>,...,<n(99)>,<ref(99)>

Parameters

<s>	Switching input level control
On	Input level control enabled
Off	Input level control disabled
Default	Off
<n(i)>	Step (i)th segment number when input level switched
Range	1 to 1598
Resolution	1
<ref(i)>	Step (i)th input level
Range	–65.0 to +35.0 dBm (Port1/Port2) –65.0 to +25.0 dBm (Port3/Port4)
Resolution	0.1 dB
Suffix Code	DBM (uses dBm when omitted)
i	Number of switching input level
Range	0 to 99

Details

- ref(0) sets the input level of the header segment. Therefore, the segment number n(x) cannot be specified.
- The ref(0) and subsequent ref(i) arguments can be omitted if <s> is set to OFF. Note that n(x) and ref(x) can be set or omitted as a pair.
- The n(1) and subsequent n(i) arguments can be omitted if <s> is set to ON. Note that n(x) and ref(x) can be set or omitted as a pair.
- If the command parameters are omitted, the number of parameters in query responses must be the same as the number of parameters set using the command.

- If the cable loss correction is set to ON, the cable loss should be added to the setting range of the input level.
  If the cable loss is 5 dB, use the setting range from –60.0 to 40.0 dB.
  In this case, if the parameter is set to –65.0 dBm, an "out of parameter setting range" error occurs. (The response to :SYSTem:ERRor? returns 220, "Parameter error".)
  Sending :INITiate:CELLular:MEASurement:SINGle queries whether the configured level is within the parameter setting range.

Example of Use

To set the input level control to ON, the header segment input level to 24 dBm, the input levels of segment 20 and subsequent segments to 0 dBm, and the input levels of segment 30 and subsequent segments to –20 dBm:
:CONF:CELL:COMM:TRXF:TXR ON,24,20,0,30, -20
:CONF:CELL:COMM:TRXF:TXR?
> ON,24.0,20,0.0,30,-20.0

:CONFigure:CELLular:GENerator:RFSettings:FREQuency

Downlink Frequency

Function

Sets or queries downlink frequency

Command

```
:CONFigure:CELLular:GENerator:RFSettings:FREQuency <dl_freq>
```

Query

```
:CONFigure:CELLular:GENerator:RFSettings:FREQuency?
```

Response

<dl_freq>

No suffix code

The value is returned in Hz units.

Parameter

<dl_freq>	Downlink frequency
Range	400.000000 to 6000.000000 MHz
Resolution	1 Hz
Suffix Code	HZ, KHZ, KZ, MHZ, MZ, GHZ, GZ (uses Hz when omitted)
Default	1000.000000 MHz

Examples of Use

To set the downlink frequency to 2050 MHz:

:CONF:CELL:GEN:RFS:FREQ 2050MHZ

To query the currently configured downlink frequency:

:CONF:CELL:GEN:RFS:FREQ?

>2050000000

Remarks

Changing the setting of the downlink frequency does not change the setting of the downlink channel.

:CONFigure:CELLular:GENerator:RFSettings:LEVel

Output Level

Function

Sets or queries RF signal output level of MU887000A connector

Command

```
:CONFigure:CELLular:GENerator:RFSettings:LEVel <level>
```

Query

```
:CONFigure:CELLular:GENerator:RFSettings:LEVel?
```

Response

<level>
No suffix code
The value is returned in dBm units.

Parameter

<level>	Output level
Range	–130.0 to –10.0 dBm (Port1/Port2)
	–120.0 to 0.0 dBm (Port3/Port4)
Resolution	0.1 dB
Suffix Code	DBM (uses dBm when omitted)
Default	–120.0 dBm

Details

The setting range varies with the output port setting.
When the Cable Loss Calibration is ON, the cable loss is subtracted from the output level setting range.
When the cable loss is 5 dB, the Port1/Port2 setting range is –135.0 to –15.0 dBm.

Example of Use

To set the output level to –50.0 dBm:
:CONF:CELL:GEN:RFS:LEV -50.0

To query the currently configured input level:
:CONF:CELL:GEN:RFS:LEV?
>-50.0

Related Commands

[:ROUTe]:EXTLoss:TABLe:SWITch
:CALCulate:EXTLoss:TABLe:SETTing
:CALCulate:EXTLoss:TABLe:VALue

For details of the commands, refer to Chapter 5 “SCPI Command Reference” in the *MU887000A TRX Test Module Operation Manual*.

:CONFigure:CELLular:MEASurement:RFSettings:FREQuency

Uplink Frequency

Function

Sets or queries Rx frequency (uplink frequency) of MU887000A

Command

```
:CONFigure:CELLular:MEASurement:RFSettings:FREQuency <ul_freq>
```

Query

```
:CONFigure:CELLular:MEASurement:RFSettings:FREQuency?
```

Response

<ul_freq>
No suffix code
The value is returned in Hz units.

Parameter

<ul_freq>	Uplink frequency
Range	400.000000 to 6000.000000 MHz
Resolution	1 Hz
Suffix Code	HZ, KHZ, KZ, MHZ, MZ, GHZ, GZ (uses Hz when omitted)
Default	2000.000000 MHz

Examples of Use

To set the uplink frequency to 1950 MHz:
:CONF:CELL:MEAS:RFS:FREQ 1950MHZ

To query the currently configured uplink frequency:
:CONF:CELL:MEAS:RFS:FREQ?
>1950000000

Remarks

Changing the setting of the uplink frequency does not change the setting of the uplink channel.

:CONFigure:CELLular:MEASurement:RFSettings:LEVel

Input Level

Function

Sets or queries input level of MU887000A connector

Command

```
:CONFigure:CELLular:MEASurement:RFSettings:LEVel <level>
```

Query

```
:CONFigure:CELLular:MEASurement:RFSettings:LEVel?
```

Response

<level>
No suffix code
The value is returned in dBm units.

Parameter

<level>	Input level
Range	–65.0 to +35.0 dBm (Port1/Port2)
	–65.0 to +25.0 dBm (Port3/Port4)
Resolution	0.1 dBm
Suffix Code	DBM (uses dBm when omitted)
Default	–10.0 dBm

Details

The setting range varies with the input port setting.
When the Cable Loss Calibration is ON, the cable loss is added to the input level setting range.
When the cable loss is 5 dB, the Port1/Port2 setting range is –60.0 to +40.0 dBm.

Examples of Use

To set the input level to –10.0 dBm:
:CONF:CELL:MEAS:RFS:LEV -10.0

To query the currently configured input level:
:CONF:CELL:MEAS:RFS:LEV?
>-10.0

Related Commands

[:ROUTe]:EXTLoss:TABLe:SWITch
:CALCulate:EXTLoss:TABLe:SETTing
:CALCulate:EXTLoss:TABLe:VALue
For details of the commands, refer to Chapter 5 “SCPI Command Reference” in the *MU887000A TRX Test Module Operation Manual*.

:CONFigure:CELLular:MEASurement:SELect

Measurement Select

Function

Sets or queries measurement functions of MX887010A

Command

```
:CONFigure:CELLular:MEASurement:SELect <meassel>
```

Query

```
:CONFigure:CELLular:MEASurement:SELect?
```

Response

<meassel>

Parameter

<meassel>	Selection of measurement functions
SPMON	Spectrum monitor
MULTIPWR	Multiple power measurement
TRXFREQ	Tx/Rx vs Frequency
NBANDPVT	Narrowband Power vs Time
Default	SPMON

Example of Use

To set the measurement function to Spectrum monitor:
:CONF:CELL:MEAS:SEL SPMON
:CONF:CELL:MEAS:SEL?
> SPMON

:FETCh:CELLular:COMMon:IQCapture:IQData?

IQ Capture - IQ Data

Function

Queries the captured IQ data. Response is returned in binary data.

Query

```
:FETCh:CELLular:COMMon:IQCapture:IQData? <type>,<start>,<num>
```

Response

#XY<Y byte binary data><terminator>

X and Y are ASCII characters. The X value is the digit number of the Y value. If the Y value is 12500, the X value is 5.
The binary data <Y byte binary data> is output in the order of i(0),q(0),i(1),q(1),...,i(num–1),q(num–1) in 32bit floating type.

Parameters

<type>	Type
Range	2
Resolution	1
<start>	Offset position to start reading
Range	0 to 399999 (Maximum value: (Number of captured samples) – 1)
Resolution	1
<num>	Number of samples to read out
Range	1 to 400000
Resolution	1
<i(n)>	n’th I data
<q(n)>	n’th Q data
<terminator>	terminator

Details

If the range specified by the start position and the data length is greater than the number of captured samples, then the data of the interval that does not contain IQ data becomes 0.

Example of Use

To read the captured IQ data of 10,000 samples from the 0th sample.
:FETC:CELL:COMM:IQC:IQD? 2,0,10000

4 SCPI Command Reference

Related Command

:FETCh:CELLular:COMMon:IQCapture:SRATe	Queries the sampling rate of IQ Capture
:FETCh:CELLular:COMMon:IQCapture:SAMPles	Queries the number of samples captured by IQ Capture

:FETCh:CELLular:COMMon:IQCapture:SAMPles?

IQ Capture - Number of Samples

Function

Queries the number of samples captured by IQ Capture

Query

```
:FETCh:CELLular:COMMon:IQCapture:SAMPles?
```

Response

```
<sample>
```

Parameter

<sample>	Number of captured samples
Range	200 to 400000
Resolution	1

Example of Use

Queries the number of samples captured by IQ capture:

:FETC:CELL:COMM:IQC:SAMP?

>200

:FETCh:CELLular:COMMon:IQCapture:SRATe?

IQ Capture - Sampling Rate

Function

Queries the sampling rate for IQ Capture

Query

```
:FETCh:CELLular:COMMon:IQCapture:SRATe?
```

Response

```
<rate>
```

Unit MSPS (Mega Sample Per Second)

Parameter

<rate>		Sampling rate
	Range	40.000000,10.000000,5.000000,2.000000,1.000000,0.500000,0.200000, 1.083333 0.000000 when not measured
	Resolution	0.000001

Example of Use

Queries the sampling rate for IQ Capture:
:FETC:CELL:COMM:IQC:SRAT?
>20.000000

:FETCh:CELLular:COMMon:MULTipower:MRFPower?

Multiple Power Measurement - Level

Function

Queries result of average power measurement for each step at multiple power measurement

Query

```
:FETCh:CELLular:COMMon:MULTipower:MRFPower? <pos>,<num>
```

Response

l(1),l(2)...,l(num)

n represents the step count

Unit	dBm

Parameters

<pos>	Step number where query begins
Range	1 to 99
Resolution	1
<num>	Step count queried
Range	1 to (100 – <pos>)
Resolution	1
<l(num)>	Average power of (num)th step
Resolution	0.01 dB
Suffix Code	None

Example of Use

To query measurement results for 50 steps beginning at step 1:

:FETC:CELL:COMM:MULT:MRFP? 1,50

> -10.00,999.99,-9.99,…,-10.00

Remarks

If the :CONFigure:CELLular:COMMon:MULTipower:IROutput command is set to OFF, an invalid measurement result is returned as 999.99.

If the measurement result of the step is level over, the response is 999.99.

:FETCh:CELLular:COMMon:NARRowband:POWer?

Narrowband Power vs Time - Measurement Result

Function

Queries average power of each measurement interval at Narrowband Power vs. Time measurement

Query

```
:FETCh:CELLular:COMMon:NARRowband:POWer?
```

Response

<p(0)>,<p(1)>,<p(2)>,...,<p(i–1)>

Parameter

<p(i–1)>	Average power of (i)th segment
Resolution	0.01 dB

Details

p(0) is returned in dBm. Relative values (dB) to p(0) are returned for other results.

Example of Use

:FETC:CELL:COMM:NARR:POW?

> -15.31,0.83,2.24, -1.56,-0.58,0.66,....

The first level is –15.31 dBm. Subsequent level differences are 0.8, 2.24, –1.56, –0.58, and 0.66 dB.

:FETCh:CELLular:COMMon:SPMonitor:POWer?

Spectrum Monitor - Power

Function

Queries total power of spectrum monitor measurements

Query

```
:FETCh:CELLular:COMMon:SPMonitor:POWer?
```

Response

<power>

Unit dBm

Parameter

<power>	Power conversion value
Resolution	0.01 dB

Example of Use

To query the total power of spectrum monitor measurements:

:FETC:CELL:COMM:SPM:POW?

> -10.01

Related Command

:CONFigure:CELLular:COMMon:SPMonitor:PMBW

:FETCh:CELLular:COMMon:SPMonitor:TRACe:DATA?

Spectrum Monitor - Data

Function

Queries spectrum data of spectrum monitor measurements
It is used to specify the position where the query begins and the number of points.

Query

```
:FETCh:CELLular:COMMon:SPMonitor:TRACe:DATA? <format>,<position>,<length>
```

Response

<data(1)>,<data(2)>,..,<data(length)>

Unit	dBm

Parameters

<format>	Format
2	Spectrum data of every point
<position>	Position where query of spectrum data begins
Range	0 to (number of points of data – 1)
Resolution	1
Suffix Code	No suffix code
Default	0
<length>	Number of data read by spectrum data query
Range	1 to (number of points of data – position value)
Resolution	1
Suffix Code	No suffix code
Default	1

Examples of Use

When querying the spectrum data of the spectrum monitor,
to set the setting item to Spectrum monitor:
:CONF:CELL:MEAS:STAN COMMON
:CONF:CELL:MEAS:SEL SPMON

To start the measurement:
:INIT:CELL:MEAS:SING

To query the spectrum data of spectrum monitor sampled in 501 points:
:FETC:CELL:COMM:SPM:TRAC:DATA? 2,0,501

Related Command

:FETCh:CELLular:COMMon:SPMonitor:TRACe:POINt is used to query the number of data points.

:FETCh:CELLular:COMMon:SPMonitor:TRACe:POINt?

Spectrum Monitor - Trace Point

Function

Queries number of points of spectrum monitor measurement data

Query

```
:FETCh:CELLular:COMMon:SPMonitor:TRACe:POINt?
```

Response

<point>

Parameter

<point>	Number of points
Range	513, 641, 821, 1025, 1281, 1641, 2049, 2561, 4097, 6555, 8193, 10241, 16385, 26217

Example of Use

To query the number of points of spectrum monitor measurement data:

:FETC:CELL:COMM:SPM:TRAC:POIN?

>4097

Remarks

For the relationship between the measurement conditions and the number of data points, refer to Table 2.2.1-1 “Span and Resolution Setting Range and Number of Data Points”.

:FETCh:CELLular:COMMon:TRXFrequency:LEVel?

Tx/Rx vs Frequency measurement – Level

Function

Queries average power of each segment according to Tx/Rx vs. Frequency measurement results

Query

```
:FETCh:CELLular:COMMon:TRXFrequency:LEVel?
```

Response

<l(1)>,<l(2)>,...,<l(n)>
(n = (number of segments – 1) × number of sequences)

Unit	dBm

Parameter

<l(n)>	Average power of nth
Resolution	0.01 dB
Suffix Code	None

Example of Use

To query measurement results at Tx/Rx vs. Frequency measurement:
:FETC:CELL:COMM:TRXF:LEV?
> -10.00,999.99,-8.88,…,-10.00

Remarks

When the :CONFigure:CELLular:COMMon:TRXFrequency:IROutput command is set to OFF, the invalid measurement result is indicated as 999.99.
If the measurement result of the segment is level over, the response is 999.99.

:FETCh:CELLular:COMMon:TRXFrequency:LEVel:NUMBer?

Tx/Rx vs Frequency Measurement - Valid Number of Sequences and Segments

Function

Queries number of valid measurement results at Tx/Rx vs. Frequency measurement

Query

```
:FETCh:CELLular:COMMon:TRXFrequency:LEVel:NUMBer?
```

Response

<n>,<seg>,<seq>

Parameters

<n>	Number of measurement results = (number of segments – 1) × number of sequences
Range	1 to 6396
Resolution	1
<seg>	Number of segments – 1
Range	1 to 1599
Resolution	1
<seq>	Number of sequences
Range	1 to 400
Resolution	1

Example of Use

To query the number of valid measurement results at Tx/Rx vs. Frequency measurement:

:FETC:CELL:COMM:TRXF:LEV:NUMB?

> 56,14,4

:TRIGger:CELLular:COMMon:IQCapture:DELay

IQ Capture - Trigger Delay

Function

Sets or queries the trigger delay time for IQ Capture

Command

```
:TRIGger:CELLular:COMMon:IQCapture:DELay <delay>
```

Query

```
:TRIGger:CELLular:COMMon:IQCapture:DELay?
```

Response

```
<delay>
```

Unit	μs

Parameter

<time>	Trigger delay time
Range	–500 to 500
Resolution	1
Suffix Code	NS, US, MS, S (uses μs when omitted)
Default	0

Example of Use

To set the trigger delay time to 0 μs:

:TRIG:CELL:COMM:IQC:DEL 0

:TRIG:CELL:COMM:IQC:DEL?

>0

:TRIGger:CELLular:COMMon:IQCapture:THReshold

IQ Capture - Trigger Level

Function

Sets or queries the trigger level for IQ Capture

Command

```
:TRIGger:CELLular:COMMon:IQCapture:THReshold <level>
```

Query

```
:TRIGger:CELLular:COMMon:IQCapture:THReshold?
```

Response

```
<level>
```

Unit	dB

Parameter

<level>	Trigger level
Range	–30 to –3
Resolution	1 dB
Suffix Code	DB (uses dB when omitted)
Default	–30

Example of Use

To set the trigger level to –30 dB:

:TRIG:CELL:COMM:IQC:THR -30

:TRIG:CELL:COMM:IQC:THR?

>-30

:TRIGger:CELLular:COMMon:IQCapture:TOUT

IQ Capture - Trigger Timeout

Function

Sets or queries the trigger timeout for IQ Capture

Command

```
:TRIGger:CELLular:COMMon:IQCapture:TOUT <time>
```

Query

```
:TRIGger:CELLular:COMMon:IQCapture:TOUT?
```

Response

```
<time>
```

Unit	s

Parameter

<timeout>	Trigger timeout
Range	1 to 30 s
Resolution	1 s
Suffix Code	NS, US, MS, S (uses s when omitted)
Default	5 s

Example of Use

To set the trigger timeout to 5 s:

:TRIG:CELL:COMM:IQC:TOUT 5

:TRIG:CELL:COMM:IQC:TOUT?

>5

:TRIGger:CELLular:COMMon:MULTipower:THReshold

Multiple Power Measurement - Trigger Level

Function

Sets or queries trigger level at multiple power measurement

Command

```
:TRIGger:CELLular:COMMon:MULTipower:THReshold <level>
```

Query

```
:TRIGger:CELLular:COMMon:MULTipower:THReshold?
```

Response

<level>

Unit	dB

Parameter

<level>	Trigger level
Range	–40 to 0 dB
Resolution	1 dB
Suffix Code	DB (uses dB when omitted)
Default	–30 dB

Example of Use

To set the trigger level to –10 dB:

:TRIG:CELL:COMM:MULT:THR -10

:TRIG:CELL:COMM:MULT:THR?

> -10

:TRIGger:CELLular:COMMon:MULTipower:TOUT

Multiple Power Measurement - Trigger Timeout

Function

Sets or queries trigger timeout at multiple power measurement

Command

```
:TRIGger:CELLular:COMMon:MULTipower:TOUT <timeout>
```

Query

```
:TRIGger:CELLular:COMMon:MULTipower:TOUT?
```

Response

<timeout>

Unit	s

Parameter

<timeout>	Trigger timeout
Range	1 to 30 s
Resolution	1 s
Suffix Code	NS, US, MS, S (uses s when omitted)
Default	5 s

Example of Use

To set the trigger timeout to 10 s:

:TRIG:CELL:COMM:MULT:TOUT 10

:TRIG:CELL:COMM:MULT:TOUT?

> 10

:TRIGger:CELLular:COMMon:NARRowband:TOUT

Narrowband Power vs Time - Trigger Timeout

Function

Sets or queries trigger timeout at Narrowband Power vs. Time measurement

Command

```
:TRIGger:CELLular:COMMon:NARRowband:TOUT <timeout>
```

Query

```
:TRIGger:CELLular:COMMon:NARRowband:TOUT?
```

Response

<timeout>

Unit	s

Parameter

<timeout>	Timeout
Range	1 to 30 s
Resolution	1 s
Suffix Code	NS, US, MS, S (uses s when omitted)
Default	10 s

Example of Use

To set the trigger timeout to 10 s:

:TRIG:CELL:COMM:NARR:TOUT 10

:TRIG:CELL:COMM:NARR:TOUT?

> 10

:TRIGger:CELLular:COMMon:SPMonitor:DELay

Spectrum Monitor - Trigger Delay

Function

Sets or queries trigger delay time

Command

```
:TRIGger:CELLular:COMMon:SPMonitor:DELay <time>
```

Query

```
:TRIGger:CELLular:COMMon:SPMonitor:DELay?
```

Response

<time>

Unit	ms

Parameter

<time>	Trigger delay time
Range	–9.99 to 9.99 ms
Resolution	0.01 ms
Suffix Code	NS, US, MS, S (uses ms when omitted)
Default	0.00 ms

Example of Use

To set the trigger delay time to –1.23 ms:

:TRIG:CELL:COMM:SPM:DEL -1.23

:TRIG:CELL:COMM:SPM:DEL?

> -1.23

:TRIGger:CELLular:COMMon:SPMonitor:SOURce

Spectrum Monitor - Trigger Source

Function

Sets or queries measurement start trigger at spectrum monitor measurement

Command

```
:TRIGger:CELLular:COMMon:SPMonitor:SOURce <source>
```

Query

```
:TRIGger:CELLular:COMMon:SPMonitor:SOURce?
```

Response

<source>

Parameter

<source>	Trigger source
FREERUN	No trigger
PWR	Signal level
Default	FREERUN

Example of Use

To set the parameter to no trigger:

:TRIG:CELL:COMM:SPM:SOUR FREERUN

:TRIG:CELL:COMM:SPM:SOUR?

> FREERUN

:TRIGger:CELLular:COMMon:SPMonitor:TOUT

Spectrum Monitor - Trigger Timeout

Function

Sets or queries trigger timeout

Command

```
:TRIGger:CELLular:COMMon:SPMonitor:TOUT <time>
```

Query

```
:TRIGger:CELLular:COMMon:SPMonitor:TOUT?
```

Response

<time>

Unit	s

Parameter

<time>	Timeout
Range	1 to 60 s
Resolution	1 s
Suffix Code	NS, US, MS, S (uses s when omitted)
Default	10 s

Example of Use

To set the trigger timeout to 5 s:
:TRIG:CELL:COMM:SPM:TOUT 5
:TRIG:CELL:COMM:SPM:TOUT?
> 5

:TRIGger:CELLular:COMMon:TRXFrequency:DELay

Tx/Rx vs. Frequency Measurement - Trigger Delay

Function

Sets or queries trigger delay time at Tx/Rx vs. Frequency measurement

Command

```
:TRIGger:CELLular:COMMon:TRXFrequency:DELay <delay>
```

Query

```
:TRIGger:CELLular:COMMon:TRXFrequency:DELay?
```

Response

<delay>

Unit	ms

Parameter

<delay>	Trigger delay time
Range	0 to 1000.000 ms
Resolution	0.001 ms
Suffix Code	NS, US, MS, S (uses ms when omitted)
Default	0.000 ms

Example of Use

To set the trigger delay time to 10.555 ms:

:TRIG:CELL:COMM:TRXF:DEL 10.555

:TRIG:CELL:COMM:TRXF:DEL?

> 10.555

:TRIGger:CELLular:COMMon:TRXFrequency:THReshold

Tx/Rx vs Frequency Measurement - Trigger Level

Function

Sets or queries trigger level at Tx/Rx vs. Frequency measurement

Command

```
:TRIGger:CELLular:COMMon:TRXFrequency:THReshold <level>
```

Query

```
:TRIGger:CELLular:COMMon:TRXFrequency:THReshold?
```

Response

<level>

Unit	dB

Parameter

<level>	Trigger level
Range	–40 to 0 dB
Resolution	1 dB
Suffix Code	DB (uses dB when omitted)
Default	–30 dB

Example of Use

To set the trigger level to –10 dB:

:TRIG:CELL:COMM:TRXF:THR -10

:TRIG:CELL:COMM:TRXF:THR?

> -10

:TRIGger:CELLular:COMMon:TRXFrequency:TOUT

Tx/Rx vs Frequency Measurement - Trigger Timeout

Function

Sets or queries trigger timeout at Tx/Rx vs. Frequency measurement

Command

```
:TRIGger:CELLular:COMMon:TRXFrequency:TOUT <timeout>
```

Query

```
:TRIGger:CELLular:COMMon:TRXFrequency:TOUT?
```

Response

<timeout>

Unit	s

Parameter

<timeout>	Trigger timeout
Range	1 to 30 s
Resolution	1 s
Suffix Code	NS, US, MS, S (uses s when omitted)
Default	5 s

Example of Use

To set the trigger timeout to 10 s:

:TRIG:CELL:COMM:TRXF:TOUT 10

:TRIG:CELL:COMM:TRXF:TOUT?

> 10

4.2.3 Sequence measurement commands

:CONFigure:CELLular:GENerator:RFSettings:FREQuency

Downlink Frequency

Function

Sets or queries downlink frequency

Command

```
:CONFigure:CELLular:GENerator:RFSettings:FREQuency <dl_freq>
```

Query

```
:CONFigure:CELLular:GENerator:RFSettings:FREQuency?
```

Response

<dl_freq>
No suffix code
The value is returned in Hz units.

Parameter

<dl_freq>	Downlink frequency
Range	400.000000 to 6000.000000 MHz
Resolution	1 Hz
Suffix Code	HZ, KHZ, KZ, MHZ, MZ, GHZ, GZ (uses Hz when omitted)
Default	2140.000000 MHz

Examples of Use

To set the downlink frequency to 2050 MHz:
:CONF:CELL:GEN:RFS:FREQ 2050MHZ

To query the currently configured downlink frequency:
:CONF:CELL:GEN:RFS:FREQ?
>2050000000

Remarks

Changing the setting of the downlink frequency does not change the setting of the downlink channel.

:CONFigure:CELLular:GENerator:RFSettings:LEVel

Output Level

Function

Sets or queries RF signal output level of MU887000A connector

Command

```
:CONFigure:CELLular:GENerator:RFSettings:LEVel <level>
```

Query

```
:CONFigure:CELLular:GENerator:RFSettings:LEVel?
```

Response

<level>

No suffix code

The value is returned in dBm units.

Parameter

<level>	Output level
Range	–130.0 to –10.0 dBm (Port1/Port2)
	–120.0 to 0.0 dBm (Port3/Port4)
Resolution	0.1 dB
Suffix Code	DBM (uses dBm when omitted)
Default	–60.0 dBm

Details

The setting range varies with the output port setting.

When the Cable Loss Calibration is ON, the cable loss is subtracted from the output level setting range.

When the cable loss is 5 dB, the Port1/Port2 setting range is –135.0 to –15.0 dBm.

Examples of Use

To set the output level to –50.0 dBm:

:CONF:CELL:GEN:RFS:LEV -50.0

To query the input level currently configured:

:CONF:CELL:GEN:RFS:LEV?

>-50.0

Related Commands

[:ROUTe]:EXTLoss:TABLe:SWITch
:CALCulate:EXTLoss:TABLe:SETTing
:CALCulate:EXTLoss:TABLe:VALue
For details of the commands, refer to Chapter 5 “SCPI Command Reference” in the *MU887000A TRX Test Module Operation Manual*.

:CONFigure:CELLular:MEASurement:RFSettings:FREQuency

Uplink Frequency

Function

Sets or queries MU887000A Rx frequency (uplink frequency)

Command

```
:CONFigure:CELLular:MEASurement:RFSettings:FREQuency <ul_freq>
```

Query

```
:CONFigure:CELLular:MEASurement:RFSettings:FREQuency?
```

Response

<ul_freq>
No suffix code
The value is returned in Hz units.

Parameter

<ul_freq>	Uplink frequency
Range	400.000000 to 6000.000000 MHz
Resolution	1 Hz
Suffix Code	HZ, KHZ, KZ, MHZ, MZ, GHZ, GZ (uses Hz when omitted)
Default	1950.000000 MHz

Example of Use

To set the uplink frequency to 1950 MHz:
:CONF:CELL:MEAS:RFS:FREQ 1950MHZ

To query the currently configured uplink frequency:
:CONF:CELL:MEAS:RFS:FREQ?
>1950000000

Remarks

Changing the setting of the uplink frequency does not change the setting of the uplink channel.

:CONFigure:CELLular:MEASurement:RFSettings:LEVel

Input Level

Function

Sets or queries input level of MU887000A connector

Command

```
:CONFigure:CELLular:MEASurement:RFSettings:LEVel <level>
```

Query

```
:CONFigure:CELLular:MEASurement:RFSettings:LEVel?
```

Response

<level>

No suffix code

The value is returned in dBm units.

Parameter

<level>	Input level
Range	–65.0 to +35.0 dBm (Port1/Port2)
	–65.0 to +25.0 dBm (Port3/Port4)
Resolution	0.1 dBm
Suffix Code	DBM (uses dBm when omitted)
Default	–10.0 dBm

Details

The setting range varies with the input port setting.

When the Cable Loss Calibration is ON, the cable loss is added to the input level setting range.

When the cable loss is 5 dB, the Port1/Port2 setting range is –60.0 to +40.0 dBm.

Examples of Use

To set the input level to –10.0 dBm:

:CONF:CELL:MEAS:RFS:LEV -10.0

To query the currently configured input level:

:CONF:CELL:MEAS:RFS:LEV?

> -10.0

Related Commands

[:ROUTe]:EXTLoss:TABLe:SWITch

:CALCulate:EXTLoss:TABLe:SETTing

:CALCulate:EXTLoss:TABLe:VALue

For details of the commands, refer to Chapter 5 “SCPI Command Reference” in the *MU887000A TRX Test Module Operation Manual*.

:CONFigure:CELLular:SEQuence:CONTrol

Sequence Control Parameter - Sequence Control

Function

Sets or queries start and stop segments in sequence table.
Sets the parameters for both measurement and signal transmission.

Command

```
:CONFigure:CELLular:SEQuence:CONTrol <start>,<end>
```

Query

```
:CONFigure:CELLular:SEQuence:CONTrol?
```

Response

<start>,<end>

Parameters

<start>	Start segment
Range	0 to 1999
Resolution	1
Default	0
<end>	Stop segment
Range	<start> to 1999
Resolution	1
Default	199

Details

<start> = 0 to 1999, <end> = 0 to 1999 where <end> ≥ <start>
Whether the set sequence table can be executed is evaluated.
Use the :FETCh:CELLular:SEQuence:ERRor? command to query the error details.

Example of Use

To set the start and stop segments to 20 and 55, respectively:
:CONF:CELL:SEQ:CONT 20,52
:CONF:CELL:SEQ:CONT?
> 20,52

:CONFigure:CELLular:SEQuence:CONTrol:TX

Sequence Control Parameter - Sequence Control

Function

Sets or queries start and stop segments in sequence table.
Sets the measurement parameters only, without affecting the signal transmission parameters.

Command

```
:CONFigure:CELLular:SEQuence:CONTrol:TX <start>,<end>
```

Query

```
:CONFigure:CELLular:SEQuence:CONTrol:TX?
```

Response

```
<start>,<end>
```

Parameters

<start>	Start segment
Range	0 to 1999
Resolution	1
Default	0
<end>	Stop segment
Range	<start> to 1999
Resolution	1
Default	1999

Details

<start> = 0 to 1999, <end> = 0 to 1999 where <end> ≥ <start>
Whether the set sequence table can be executed is evaluated.
Use the :FETCh:CELLular:SEQuence:ERRor? command to query the error details.

Examples of Use

To set the start and stop segments to 20 and 55, respectively:
:CONF:CELL:SEQ:CONT 20,55
:CONF:CELL:SEQ:CONT?
> 20,55

:CONFigure:CELLular:SEQuence:RFSettings:REINit

Sequence Control Parameter - Sequence End State Reinitialization

Function

Sets initialization of following items after completion of sequence

- Downlink frequency
- Output level
- Output waveform pattern
- Uplink frequency
- Input level

It queries the initialization settings of the parameters after completion of the sequence.

Command

```
:CONFigure:CELLular:SEQuence:RFSettings:REINit <sw>
```

Query

```
:CONFigure:CELLular:SEQuence:RFSettings:REINit?
```

Response

<sw>

Parameter

<sw>	Initialization after sequence completion
ON	Resets target parameters
OFF	Holds last segment settings
Default	ON

Details

If the parameter is set to ON, the settings are initialized to the values configured by the following commands after the sequence completion.

Downlink frequency
:CONFigure:CELLular:GENerator:RFSettings:FREQuency
Output level
:CONFigure:CELLular:GENerator:RFSettings:LEVel
Output waveform pattern
:CONFigure:CELLular:GENerator:ARB:WAVeform:PATTern:SELect
Uplink frequency
:CONFigure:CELLular:MEASurementRFSettings:FREQuency
Input level
:CONFigure:CELLular:MEASurement:RFSettings:LEVel

If the parameter is set to OFF, these settings remain those of the sequence stop segment.

Example of Use

To initialize after sequence completion:

:CONF:CELL:SEQ:RFS:REIN ON

:CONF:CELL:SEQ:RFS:REIN?

> ON

:CONFigure:CELLular:SEQuence:RFSettings:TRX

Sequence Table Parameter - TRX Control

Function

Sets or queries following items in sequence table
- Uplink Rx frequency
- Input level
- Downlink frequency
- Output level
- Waveform pattern

Command

```
:CONFigure:CELLular:SEQuence:RFSettings:TRX
<seg>,<ul_freq>,<ref>,<dl_freq>,<level>,<pat>
```

Query

```
:CONFigure:CELLular:SEQuence:RFSettings:TRX? <seg>
```

Response

<ul_freq>,<ref>,<dl_freq>,<level>,<pat>

Parameters

<seg>	Segment number
Range	0 to 1999
Resolution	1
<ul_freq>	Uplink frequency
Range	400.000000 to 6000.000000 MHz
Resolution	0.000001 MHz
Suffix Code	HZ, KHZ, KZ, MHZ, MZ, GHZ, GZ (uses MHz when omitted)
Default	1950.000000 MHz
<ref>	Input level
Range	–65.0 to +35 dBm (Port1/Port2) –65.0 to +25 dBm (Port3/Port4)
Resolution	0.1 dB
Suffix Code	DBM (uses dBm when omitted)
Default	–10.0 dBm
<dl_freq>	Downlink frequency
Range	400.000000 to 6000.000000 MHz
Resolution	0.000001 MHz
Suffix Code	HZ, KHZ, KZ, MHZ, MZ, GHZ, GZ (uses MHz when omitted)
Default	2140.000000 MHz

<level>	Output level
Range	–130.0 to –10.0 dBm (Port1/Port2)
	–120.0 to 0.0 dBm (Port3/Port4)
Resolution	0.1 dB
Suffix Code	DBM (uses dBm when omitted)
Default	–60.0 dBm
<pat>	Transmission signal pattern
PAT1 to PATn	Pattern number (n: waveform information file group range)
CW	Modulation turned OFF
OFF	Output level turned OFF
NC	Waveform pattern not configured in this segment (holds currently configured waveform pattern)
Default	CW

Details

The setting range varies with the input/output port setting.
If Cable Loss Correction is ON, the cable loss is added to the range of the input level and subtracted from the range of output level.
If the cable loss is 5 dB, the input and output levels are as follows:

Input level	–60.0 to +40 dBm
Output level	–135.0 to –15.0 dBm

In this case, if the output level is set to –10.0 dBm, an out-of-parameter setting range error occurs.
Whether an out-of-parameter setting range error has occurred is determined during execution of the following commands:
:CONFigure:CELLular:SEQuence:CONTrol, :INITiate:CELLular:MEASurement:SINGle, :INITiate:CELLular:SEQuence:EXECute:TX
A measurement execution error occurs when an out-of-range error occurs.
:FETCh:CELLular:SEQuence:ERRor? is used to query the error details.

The pattern number is the same as the group number. Refer to Chapter 3, "Waveform File Details" in the *Waveform Files for Cellular Application Operation Manual*.

Example of Use

To set segment 0 as follows:
Uplink frequency set to 1950.0 MHz, input level to –10.0 dBm, downlink frequency set to 2140.0 MHz, output level set to –60.0 dBm, and no modulation:
:CONF:CELL:SEQ:RFS:TRX 0,1950.000000,-10.0,2140.000000,-60.0,CW
:CONF:CELL:SEQ:RFS:TRX? 0
> 1950.000000,-10.0,2140.000000,-60.0,CW

Remarks

The group range is the selected waveform file.
For details of the waveform pattern, refer to Chapter 3, "Waveform File Details" in the *Waveform Files for Cellular Application Operation Manual*.

:CONFigure:CELLular:SEQuence:RFSettings:TX

Sequence Table Parameter - Uplink Frequency, Input Level

Function

Sets or queries uplink frequency and input level of segments in sequence table.

Command

```
:CONFigure:CELLular:SEQuence:RFSettings:TX <seg>,<ul_freq>,<ref>
```

Query

```
:CONFigure:CELLular:SEQuence:RFSettings:TX? <seg>
```

Response

```
<ul_freq>,<ref>
```

Parameter

<seg>	Segment number
Range	0 to 1999
Resolution	1
<ul_freq>	Rx frequency (uplink)
Range	400.000000 to 6000.000000 MHz
Resolution	0.000001 MHz
Suffix code	HZ, KHZ, KZ, MHZ, MZ, GHZ, GZ (uses MHz when omitted)
Default	1950.000000 MHz
<ref>	Input level
Range	–65.0 to +35 dBm (Port1/Port2) –65.0 to +25 dBm (Port3/Port4)
Resolution	0.1 dB
Suffix code	DBM (uses dBm when omitted)
Default	–10.0 dBm

Details

This command sets only the uplink frequency and input level among the parameters that are set by :CONFigure:CELLular:SEQuence:RFSettings:TRX.
The setting range varies with the input port setting.
When the Cable Loss Calibration is ON, the cable loss is added to the input level setting range.
When the cable loss is 5 dB, the Port1/Port2 setting range is –60.0 to +40.0 dBm.
Whether an out-of-parameter setting range error has occurred is determined during execution of the following commands:
:CONFigure:CELLular:SEQuence:CONTrol, :INITiate:CELLular:MEASurement:SINGle, :INITiate:CELLular:SEQuence:EXECute:TX

Example of Use

To set the parameters for segment 1 as follows:
Uplink frequency: 1950 MHz, Input level: –10.0 dBm
:CONF:CELL:SEQ:RFS:TX 1,1950,-10.0
:CONF:CELL:SEQ:RFS:TX? 1
> 1950.000000,-10.0

:CONFigure:CELLular:SEQuence:RXPort

Sequence Table Parameter - SG Output Port

Function

Specifies segment numbers to set or query numbers of test ports transmitting RF signals

Command

```
:CONFigure:CELLular:SEQuence:RXPort <seg>,<port>
```

Query

```
:CONFigure:CELLular:SEQuence:RXPort? <seg>
```

Response

<port>

Parameters

<seg>	Segment number
Range	0 to 1999
Resolution	1
<port>	Port number
PORT1	PORT 1
PORT2	PORT 2
PORT3	PORT 3
PORT4	PORT 4
Default	PORT1

Details

PORT3 cannot be set when PORT3 is selected for RF signal input port.
PORT4 cannot be set when PORT4 is selected for RF signal input port.

Example of Use

To set the port number of segment 5 to 2:
:CONF:CELL:SEQ:RXP 5,PORT2
:CONF:CELL:SEQ:RXP? 5
> PORT2

:CONFigure:CELLular:SEQuence:SETup

Sequence Table Parameter - Measurement

Function

Sets or queries measurement conditions of segments

Command

```
:CONFigure:CELLular:SEQuence:SETup <seg>,<mode>,<step>,<mcond>
```

Query

```
:CONFigure:CELLular:SEQuence:SETup? <seg>
```

Response

<mode>,<step>,<mcond>

Parameters

<seg>	Segment number	
Range	0 to 1999	
Resolution	1	
<mode>	Measurement mode	Requires software license
TXP	Tx Power measurement mode	MX887010A
WCDMA	W-CDMA measurement mode	MX887010A and MX887011A
GSM	GSM measurement mode	MX887010A and MX887012A
CDMA2K	CDMA2000 1x measurement mode	MX887010A and MX887015A
EVDO	CDMA2000 1xEVDO measurement mode	MX887010A and MX887016A
LTE	LTE measurement mode	MX887010A and MX887013A, or MX887010A and MX887014A
TDSCDMA	TD-SCDMA measurement mode	MX887010A and MX887017A
Default	TXP	
<step>	Step count	
Range	2 to 3000	
Resolution	1	
Default	2	
<mcond>	Measurement condition number	
Range	0 to 1999	
Resolution	1	
Default	0	

Example of Use

To set settings for segment 2 as follows:

Measurement mode: TXP, Step count: 10, Measurement conditions number: 3

:CONF:CELL:SEQ:SET 2, TXP,10,3

:CONF:CELL:SEQ:SET? 2

> TXP,10,3

:CONFigure:CELLular:SEQuence:TABLe

Sequence Control Parameter - Sequence Table

Function

Sets or queries number of sequence table to operate

Command

```
:CONFigure:CELLular:SEQuence:TABLe <table>
```

Query

```
:CONFigure:CELLular:SEQuence:TABLe?
```

Response

<table>

Parameter

<table>	Sequence table number
Range	0 to 3
Resolution	1
Default	0

Example of Use

To select sequence table 1:

:CONF:CELL:SEQ:TABL 1

:CONF:CELL:SEQ:TABL?

> 1

:CONFigure:CELLular:SEQuence:TXPower:FILter

Tx Power - Bandwidth

Function

Sets or queries measurement bandwidth at Tx Power measurement

Command

```
:CONFigure:CELLular:SEQuence:TXPower:FILter <bw>
```

Query

```
:CONFigure:CELLular:SEQuence:TXPower:FILter?
```

Response

<bw>

Parameter

<bw>	Measurement bandwidth
20MHZ	20 MHz
15MHZ	15 MHz
10MHZ	10 MHz
5MHZ	5 MHz
3MHZ	3 MHz
1.4MHZ	1.4 MHz
G1MHZ	Gauss 1 MHz
WCDMA	WCDMA RRC (3.84 MHz)
CDMA2K	CDMA2000 (1.2288 MHz)
Default	20MHZ

Example of Use

To set the measurement bandwidth at Tx Power measurement to 20 MHz:

:CONF:CELL:SEQ:TXP:FIL 20MHZ

:CONF:CELL:SEQ:TXP:FIL?

> 20MHZ

:CONFigure:CELLular:SEQuence:TXPower:OLEVel

Tx Power - Output Level Pattern Select

Function

Sets or queries output level patterns at Tx Power measurement

Command

```
:CONFigure:CELLular:SEQuence:TXPower:OLEVel <mcond>,<pat>
```

Query

```
:CONFigure:CELLular:SEQuence:TXPower:OLEVel? <mcond>
```

Responses

pat

<mcond>	Measurement condition number
Range	0 to 1999
Resolution	1
<pat>	Output level pattern
NORM	Level set to segment
PAT0	Output level pattern 0
PAT1	Output level pattern 1
PAT2	Output level pattern 2
PAT3	Output level pattern 3
...	...
PAT1999	Output level pattern 1999
Default	NORM

Details

If the output level pattern is set to NORM, the signal is output at the level set for the corresponding segment in the sequence table.

Example of Use

To set the output level pattern for measurement condition 0 at Tx Power measurement to pattern 1:

:CONF:CELL:SEQ:TXP:OLEV 0,PAT1

:CONF:CELL:SEQ:TXP:OLEV? 0

> PAT1

Related Commands

If the pattern is set to NORM, the following command is used to set the output level:

:CONFigure:CELLular:SEQuence:RFSettings:TRX

The following commands are used to set the output levels of patterns 0 to 3:

:CONFigure:CELLular:SEQuence:TXPower:OLPattern0
:CONFigure:CELLular:SEQuence:TXPower:OLPattern1

:CONFigure:CELLular:SEQuence:TXPower:OLPattern0

Tx Power - System Output Level Pattern Definition (0 to 99)

Function

Sets or queries output level pattern values at Tx Power measurement
The setting range of values starts at the beginning of the output level patterns and the number of values set does not exceed 100.

Command

```
:CONFigure:CELLular:SEQuence:TXPower:OLPattern0
<pat>[,<level0>[,<level1>[,…[,<level99>]…]]]
```

Query

```
:CONFigure:CELLular:SEQuence:TXPower:OLPattern0? <pat>
```

Response

<level0>,<level1>,...,<level99>

Unit	dBm

Parameters

<pat>	Output level pattern
PAT0	Pattern 0
PAT1	Pattern 1
PAT2	Pattern 2
PAT3	Pattern 3
...	...
PAT1999	Pattern 1999
Default	PAT0
<level(0)>	Output level of step 0
<level(1)>	Output level of step 1
:	:
<level(98)>	Output level of step 98
<level(99)>	Output level of step 99
Range	–130.0 to –10.0 dBm (Port1/Port2)
	–120.0 to 0.0 dBm (Port3/Port4)
Resolution	0.1 dB
Suffix Code	DBM (uses dBm when omitted)
Default	–120.0 dBm

Details

level1 and subsequent levels can be omitted.
If the cable loss correction is set to ON, the setting range of the output level varies with the correction data value setting.
For example, if the correction data is 10 dB, the setting range of output level is between –140.0 and –20.0 dBm.
In this case, if the parameter is set to –10.0 dBm, an "out of parameter setting range" error occurs.
Sending :CONFigure:CELLular:SEQuence:CONTrol
or :INITiate:CELLular:MEASurement:SINGle queries whether the configured level is within the parameter setting range.
A measurement execution error occurs when an out-of-range error occurs.
:FETCh:CELLular:SEQuence:ERRor? is used to query the error details.

Example of Use

To set four output levels starting at the beginning output level of output level pattern 0 to –30.0, –40.0, –50.0, and –60.0, respectively:
:CONF:CELL:SEQ:TXP:OLP0 PAT0,-30.0,-40.0,-50.0,-60.0
:CONF:CELL:SEQ:TXP:OLP0? PAT0
> -30.0,-40.0,-50.0,-60.0,-120.0,…,-120.0,-120.0*
*: Actually, 100 items are always returned even if not omitted.

:CONFigure:CELLular:SEQuence:TXPower:OLPattern1

Tx Power - System Output Level Pattern Definition (50 to 99)

Function

Sets or queries output level patterns at Tx Power measurement
The setting range of values is between number 50 and number 99 of the output level pattern.

Command

```
:CONFigure:CELLular:SEQuence:TXPower:OLPattern1
<pat>,<level50>[,<level51>[….[,<level99>]…]]
```

Query

```
:CONFigure:CELLular:SEQuence:TXPower:OLPattern1? <pat>
```

Response

<level50>,<level51>,...,<level99>

Unit	dBm

Parameters

<pat>	Output level pattern
PAT0	Pattern 0
PAT1	Pattern 1
PAT2	Pattern 2
PAT3	Pattern 3
...	...
PAT1999	Pattern 1999
Default	PAT0
<level50>	Output level of step 50
:	:
<level98>	Output level of step 98
<level99>	Output level of step 99
Range	–130.0 to –10.0 dBm (Port1/Port2)
	–120.0 to 0.0 dBm (Port3/Port4)
Resolution	0.1 dB
Suffix Code	DBM (uses dBm when omitted)
Default	–120 dBm

Details

Level5 and subsequent levels can be omitted.
If the cable loss correction is set to ON, the setting range of the output level varies depending on the correction data value setting.
For instance, if the correction data is 10 dB, the setting range of output level is between –140.0 to –20.0 dBm.
In this case, if the parameter is set to -10.0 dBm, an "out of parameter setting range" error occurs.
Sending :CONFigure:CELLular:SEQuence:CONTrol
or :INITiate:CELLular:MEASurement:SINGle determines whether the configured level is within the parameter setting range.
A measurement execution error occurs when an out-of-range error occurs.
:FETCh:CELLular:SEQuence:ERRor? is used to query the error details.

Example of Use

To set output levels for number 50 to number 53 of output level pattern 0 to –30.0, –40.0, –50.0, and –60.0. respectively.
:CONF:CELL:SEQ:TXP:OLP1 PAT0,-30.0,-40.0,-50.0,-60.0
:CONF:CELL:SEQ:TXP:OLP1? PAT0
> -30.0,-40.0,-50.0,-60.0,-120.0,…,-120.0,-120.0*
*: Actually, 50 items are always returned even if not omitted.

Remarks

The command is compatible with the existing MT8820C. If output levels of number 50 to number 99 for the output level pattern are configured
using :CONFigure:CELLular:SEQuence:TXPower:OLPattern0, the command described above updates output levels of number 50 to number 99 for the output level pattern.

:CONFigure:CELLular:SEQuence:TXPower:PERiod

Tx Power - Measurement Window Offset and Window Length

Function

Sets or queries measurement interval and offset at Tx Power measurement

Command

```
:CONFigure:CELLular:SEQuence:TXPower:PERiod <offset>,<mw>
```

Query

```
:CONFigure:CELLular:SEQuence:TXPower:PERiod?
```

Response

<offset>,<mw>

Unit	%

Parameters

<offset>	Offset of measurement interval
Range	0 to 75%
Resolution	1%
Default	25%
<mw>	Measurement interval
Range	25 to 95%
Resolution	1%
Default	55%

Details

The measurement interval and its offset are specified as a proportional ratio (%) to the segment duration.

Set the offset and the measurement interval so that the total is less than 100%.

Example of Use

To set the ratios of the measurement interval and measurement interval offset at Tx Power measurement to 55% and 25% respectively:

```
:CONF:CELL:SEQ:TXP:PER 25,55
:CONF:CELL:SEQ:TXP:PER?
> 25,55
```

:CONFigure:CELLular:SEQuence:TXPower:SCOunt

Tx Power - Step Count

Function

Specifies measurement condition numbers to set or query number of measurement steps at Tx Power measurement

Command

```
:CONFigure:CELLular:SEQuence:TXPower:SCOunt <mcond>,<count>
```

Query

```
:CONFigure:CELLular:SEQuence:TXPower:SCOunt? <mcond>
```

Response

<count>

Parameters

<mcond>	Measurement condition number
Range	0 to 1999
Resolution	1
<count>	Number of measurement steps
Range	1 to 200
Resolution	1
Default	1

Example of Use

To set the number of measurement steps of measurement condition number 3 to 15:

:CONF:CELL:SEQ:TXP:SCOUNT 3,15

:CONF:CELL:SEQ:TXP:SCOUNT? 3

> 15

:CONFigure:CELLular:SEQuence:TXPower:STIMe

Tx Power - Step Time

Function

Sets or queries time per step at Tx Power measurement

Command

```
:CONFigure:CELLular:SEQuence:TXPower:STIMe <stime>
```

Query

```
:CONFigure:CELLular:SEQuence:TXPower:STIMe?
```

Response

<stime>

Unit	ms

Parameter

<stime>	Step length	
Range	1 to 80 ms, WDCMA,CDMA2K,LTE,GSM	
	WCDMA:	0.667 ms (10/15 ms)
	CDMA2K:	1.25 ms
	LTE :	0.5 ms
	GSM :	0.577 ms (15/26 ms)
Resolution	1 ms	
Default	20 ms	

Example of Use

To set the step length at Tx Power measurement to 20 ms:

:CONF:CELL:SEQ:TXP:STIME 20

:CONF:CELL:SEQ:TXP:STIME?

> 20

:FETCh:CELLular:SEQuence:ERRor?

Sequence Parameter Information - Error Check

Function

Queries setting error information of sequence table

Query

```
:FETCh:CELLular:SEQuence:ERRor? [<item>]
```

Response

Query parameter	Response
(no parameter)	<n>,<err(0)>,...,<err(n-1)>
ILVL, OLVL, STEP,DLPAT,PORT:	<ns>,<seg(0)>,...,<seg(ns-1)>
LEN:	<e>,<mem>,<exe>,<set>
OLVLNUM,PATNUM,STDNUM:	<e>,<exe>,<set>

If no error is found in the sequence table, the response returns 0.

Parameters

<item>	Parameter of sequence table	
ILVL	Input level	
OLVL	Output level	
STEP	Step count	
DLPAT	Waveform pattern	
PORT	Port	
LEN	Capture memory length	
OLVLNUM	Output level change count	
PATNUM	Waveform pattern change count	
STDNUM	Measurement mode change count	
<n>	Number of errors	
Range	0 to 4	
<err(n-1)>	Parameter with errors	
ILVL	Input level	
OLVL	Output level	
STEP	Step count	
LEN	Capture memory length	
<ns>	Number of segments with errors	
Range	0 to 2000	
<seg(ns-1)>	Segment number with errors	
Range	0 to 1999	
<e>	Presence of errors	
Range	0	No error, executable
	1	Errors found, not executable

<mem>	Memory utilization
Range	0.0 to 100.0%
Resolution	0.1%
<exe>	Number of segments capable of executing capture out of number of segments configured
Range	1 to 2000
<set>	Number of segments with capture configured
Range	1 to 2000

Details

This command can check error presence of input level, output level, step count, and capture memory length.
To query error presence of the following parameters,
use :FETCh:CELLular:SEQuence:ERRor2? command.
Waveform pattern, port, output level change count, waveform pattern change count, measurement mode change count.

To set parameters for sequence table using the following commands, errors are not checked.
:CONFigure:CELLular:SEQuence:RFSettings:TRX
:CONFigure:CELLular:SEQuence:RFSettings:TX
:CONFigure:CELLular:SEQuence:SETup

Examples of Use

To query the presence of errors:
:FETC:CELL:SEQ:ERR?
>1,ILVL

To query input level setting error information:
:FETC:CELL:SEQ:ERR? ILVL
>2,3,12

To query capture memory error information:
:FETC:CELL:SEQ:ERR? LEN
>0,25.0,20,20
The capture memory utilization is 25.0% so all captures configured in 20 segments are executable.

Remarks

Sequence measurement cannot be started if there are errors.
However, sequence measurement can be started if segment numbers with errors are excluded from the execution range using the :CONFigure:CELLular:SEQuence:CONTrol command.

:FETCh:CELLular:SEQuence:ERRor2?

Sequence Parameter Information - Error Check

Function

Queries setting error information of sequence table

Query

```
:FETCh:CELLular:SEQuence:ERRor2? <format>
```

Response

<n>,<err(0)>,..,<err(n-1)>

If no error is found in the sequence table, the response returns 0.

Parameters

<format>	Format
1	Error Check 1
<n>	Number of errors
Range	0 to 7
<err(n-1)>	Parameter with errors
ILVL	Input level
OLVL	Output level
STEP	Step count
DLPAT	Waveform pattern
PORT	Port
LEN	Capture memory length
OLVLNUM	Output level change count
PATNUM	Waveform pattern change count
STDNUM	Measurement mode change count

Details

Parameter setting errors can be checked up to seven types.
Only one of output level change count, waveform pattern change count, or measurement mode change count has an error.
Two or three of them cannot have an error simultaneously.

To set parameters for sequence table using the following commands, errors are not checked.

:CONFigure:CELLular:SEQuence:RXPort
:CONFigure:CELLular:SEQuence:RFSettings:TRX
:CONFigure:CELLular:SEQuence:RFSettings:TX
:CONFigure:CELLular:SEQuence:SETup

To query error details per parameter, use :FETCh:CELLular:SEQuence:ERRor command.

Example of Use

To query the presence of errors:
:FETC:CELL:SEQ:ERR2? 1
>2,ILVL,DLPAT

Remarks

Sequence measurement cannot be started if there are errors.
However, sequence measurement can be started if segment numbers with errors are excluded from the execution range using the :CONFigure:CELLular:SEQuence:CONTrol command.

:FETCh:CELLular:SEQuence:PROGress?

Sequence Progress

Function

Queries progress rate of sequence measurement and currently operating sequence number

Query

```
:FETCh:CELLular:SEQuence:PROGress?
```

Response

<p>,<cur>,<start>,<stop>

Parameters

<p>	Progress rate of sequence measurement
Range	0 to 100%
<cur>	Segment number currently in progress
Range	0 to 1999
<start>	Segment number where first measurement executed
Range	0 to 1999
<stop>	Segment number where last measurement executed
Range	0 to 1999

Example of Use

:FETC:CELL:SEQ:PROG?
>65,23,11,30

Remarks

The segment number where measurement is executed first and the segment number where measurement is executed last are the same as the start and stop segment numbers configured using the :CONFigure:CELLular:SEQuence:CONTrol command.

:FETCh:CELLular:SEQuence:SEG:STATe?

Specified Segment Status

Function

Specifies segment number for querying segment measurement status

Query

```
:FETCh:CELLular:SEQuence:SEG:STATe? <seg>
```

Response

<stat>

Parameters

<seg>	Segment number
Range	0 to 1999
<stat>	Segment status
0	Measurement ended normally
2	Level over
3	Under level
4	Measurement failed
5	Synchronization word not detected
9	Measurement is in progress or not measured
10	Segment not to be measured
12	Timeout of Tx measurement

The value received from MX887010A is 0, 2, 9, 10, or 12.

Example of Use

To query the status of segment 16:

:FETC:CELL:SEQ:SEG:STAT 16

> 0

:FETCh:CELLular:SEQuence:STATe?

Sequence Measurement Status

Function

Queries status of sequence measurement

Query

```
:FETCh:CELLular:SEQuence:STATe?
```

Response

<m_status>,<n>,<s(0)>,<s(1)>,..,<s(n-1)>

Parameters

<m_status>	Measurement progress status
0	Measurement ended normally
2	Level over
3	Under level
4	Measurement failed
5	Synchronization word not detected
9	Measurement is in progress or not measured
12	Timeout of Tx measurement

The value received from MX887010A is 0, 2, 9, or 12.

<n>	Number of measured segments
Range	0 to 2000
<s(n-1)>	Segment measurement status
0	Measurement ended normally
2	Level over
3	Under level
4	Measurement failed
5	Synchronization word not detected
9	Measurement is in progress or not measured
10	Segment not to be measured
12	Timeout of Tx measurement

The value received from MX887010A is 0, 2, 9, 10, or 12.

Example of Use

:FETC:CELL:SEQ:STAT?

>2,6,0,0,0,0,2,0

The result shows that six segments are measured and the fifth segment is over level.

Related Commands

:FETCh:CELLular:MEASurement:STATe

:FETCh:CELLular:SEQuence:SEG:STATe

:FETCh:CELLular:SEQuence:TXPower:TXPower?

Tx Power - Power

Function

Specifies segment number to query measurement result at Tx Power measurement

Query

```
:FETCh:CELLular:SEQuence:TXPower:TXPower? <seg>[,<mode>]
```

Response

When <mode> is omitted: <s>,<p(0)>,<p(1)>,..,<p(s-1)>
When AVG is specified: <p_ave>

Unit	<s> : No units, <p>,<p_ave> : dBm

Parameters

<seg>	Segment number
Range	0 to 1999
Resolution	1
<mode>	Measurement mode
AVG	Average
Default	AVG
<s>	Number of measurement steps
Range	1 to 200
Resolution	1
<p(s–1)>	Power of step s
Resolution	0.01 dB
<p_ave>	Average power of segment
Resolution	0.01 dB

Example of Use

To query Tx Power measurement result of segment number 10:
:FETC:CELL:SEQ:TXP:TXP? 10
>20,-36.18,-38.34,-39.06,-36.61,....

:FETCh:CELLular:SEQuence:TXPower:TXPower:ALL?

Tx Power - Power

Function

Specifies segment number to query all measurement results at Tx Power measurement

Query

```
:FETCh:CELLular:SEQuence:TXPower:TXPower:ALL? [<mode>]
```

Response

When <mode> is omitted: <s1>,<p(0)>,<p(1)>,..,<p(s1–1)>
When AVG is specified: <s2>,<p_ave(0)>,<p_ave(1)>,..,<p_ave(s2–1)>

Unit	<s1>, <s2> : No units,<p>, <p_ave>: dBm

Parameter

<mode>	Measurement mode
AVG	Average
Default	AVG
<s1>	Number of measurement steps
Range	1 to 400000
Resolution	1
<s2>	Number of measurement segments
Range	1 to 2000
Resolution	1
<p(s1–1)>	Power of step (s1–1)
Resolution	0.01 dB
<p_ave(s2–1)>	Average power of segment (s2–1)
Resolution	0.01 dB

Example of Use

To query average of all measurement results at Tx Power measurement
:FETC:CELL:SEQ:TXP:TXP:ALL? AVG
>20,-36.18,-38.34,-39.06,-36.61,....

:INITiate:CELLular:SEQuence:EXECute:TX

Start Signal Analyzer Measurement Only

Function

Sets only the parameters for the specified measurement and executes measurement, without affecting the signal transmission parameters.

Command

```
:INITiate:CELLular:SEQuence:EXECute:TX
```

:TRIGger:CELLular:MEASurement:TOUT

Trigger Timeout

Function

Sets or queries trigger timeout

Command

```
:TRIGger:CELLular:MEASurement:TOUT <time>
```

Query

```
:TRIGger:CELLular:MEASurement:TOUT?
```

Response

<time>
No suffix code, units: s

Parameter

<time>	Timeout
Range	1 to 60 s
Resolution	1 s
Suffix Code	NS, US, MS, S (uses s when omitted)
Default	10 s

Example of Use

To set the timeout to 5 s:
:TRIG:CELL:MEAS:TOUT 5
:TRIG:CELL:MEAS:TOUT?
> 5

:TRIGger:CELLular:SEQuence

Sequence Table Parameter - Trigger

Function

Sets or queries trigger conditions to start sequence measurement

Command

```
:TRIGger:CELLular:SEQuence <seg>,<src>,<slope>,<level>,<delay>
```

Query

```
:TRIGger:CELLular:SEQuence? <seg>
```

Response

<src>,<slope>,<level>,<delay>

Parameters

<seg>	Segment number
Range	0 to 1999
<src>	Trigger source
FRAME	Frame
FREERUN	Free run
PWR	Input signal power
Default	FREERUN
<slope>	Trigger slope
RISE	Trigger at rising
Default	RISE
<level>	Trigger level
Range	–40 to 0 dB
Resolution	1 dB
Suffix Code	DB (uses dB when omitted)
Default	–30 dB
<delay>	Delay time
Range	0 to 1000.000 ms
Resolution	0.001 ms
Suffix Code	NS, US, MS, S (uses ms when omitted)
Default	0.000 ms

Details

The trigger slope and trigger level are enabled when the trigger source is set to PWR.

Example of Use

To set the trigger conditions for segment 2 as follows:

Trigger source: PWR, Trigger slope: RISE, Trigger level: –30 dB, Delay time: 0

:TRIG:CELL:SEQ 2,PWR,RISE,-30,0

:TRIG:CELL:SEQ? 2

> PWR,RISE,-30,0.000

Remarks

The trigger level is the level difference from the input level configured using the following command.

:CONFigure:CELLular:MEASurement:RFSettings:LEVel

:CONFigure:CELLular:SEQuence:RFSettings:TRX

Chapter 5 Native Command Reference

This chapter describes the details of Native commands.
To switch to the Native command mode, send the command SYST:LANG NAT.

5.1 List of Commands

The following table shows the rules for describing messages.

[ ]	Messages or parameters in square brackets can be omitted.
|	Choose one of several choices. A | B | C | D indicates a choice of A, B, C, and D.
{}	Choose one of the groups in braces. A | B({C | D}) indicates a choice of A, B(C), or A, B(D).

5.1.1 Common commands

Event Status Register

Function	Command	Query	Response
End Event Status (Measurement) Register Query	-----	ESR2?	register
Error Event Status (Measurement) Register Query	-----	ESR3?	register

Common

Function	Command	Query	Response
Standard Select	STDSEL std	STDSEL?	std
Set Connect Port Direction	PORT input,output	PORT?	input,output

Measurement

Function	Command	Query	Response
Measurement Start	SNGLS	-----	-----
Measurement Stop	MEASSTOP	-----	-----
Measurement Status	-----	MSTAT?	m_status

Common Parameter

Function	Command	Query	Response
Output Level On/Off	LVL on_off	LVL?	on_off
Modulation	MOD on_off	MOD?	on_off
Waveform File Select	PACKAGE package	PACKAGE?	package
Waveform Pattern Select	DLPAT pat	DLPAT?	pat
Waveform Pattern Select (SYNC)	DLPAT_SYNC pat	DLPAT_SYNC?	pat

System

Function	Command	Query	Response
Application Select	SYSSEL app	SYSSEL?	App
Language Selection of Remote Command	SYST:LANG mode	SYST:LANG?	mode

5.1.2 Fundamental measurement commands

Common Parameters

Function	Command	Query	Response
Measurement Select	MEASSEL meassel	MEASSEL?	meassel
Input Level	ILVL level	ILVL?	level
Output Level	OLVL level	OLVL?	level
Uplink Frequency	ULFREQ ul_freq	ULFREQ?	ul_freq
Downlink Frequency	DLFREQ dl_freq	DLFREQ?	dl_freq
Downlink Frequency	RXFREQ dl_freq	RXFREQ?	dl_freq
Uplink Frequency	TXFREQ ul_freq	TXFREQ?	ul_freq

Spectrum Monitor Parameters

Function	Command	Query	Response
Spectrum Monitor - Detect Mode	SPMDETECT mode	SPMDETECT?	mode
Spectrum Monitor - Power Measurement Bandwidth	SPMPMBW width	SPMPMBW?	width
Spectrum Monitor - Resolution Bandwidth	SPMRBW bandwidth	SPMRBW?	bandwidth
Spectrum Monitor - Span	SPMSPAN span	SPMSPAN?	span
Spectrum Monitor - Storage Count	SPMSTORAGECOUNT count	SPMSTORAGECOUNT?	count
Spectrum Monitor - Storage Mode	SPMSTORAGEMODE mode	SPMSTORAGEMODE?	mode
Spectrum Monitor - Trigger Delay	SPMTGDELAY time	SPMTGDELAY?	time
Spectrum Monitor - Trigger Source	SPMTGSRC source	SPMTGSRC?	source
Spectrum Monitor - Analysis Time	SPMTIME anlylen	SPMTIME?	anlylen
Spectrum Monitor - Trigger Timeout	SPMTIMEOUT time	SPMTIMEOUT?	time

Spectrum Monitor Results

Function	Command	Query	Response
Spectrum Monitor Power	-----	SPMPWR?	power
Trace Point	-----	SPMTRACEPOINT?	point
Spectrum Monitor Data	-----	WAVESPMON? format,position,length	data(i)

Multiple Power Parameters

Function	Command	Query	Response
Multiple Power Measurement - Filter	MPMEAS_FLT filter	MPMEAS_FLT?	filter
Multiple Power Measurement - Invalid Result Output	MPMEAS_INV_RSLT_OUT on_off	MPMEAS_INV_RSLT_OUT?	on_off
Multiple Power Measurement - Measurement Window Offset & Measurement Window	MPMEAS_MW offset,meas_window	MPMEAS_MW?	offset,meas_window
Multiple Power Measurement - Number of Steps	MPMEAS_NUMSTEP numstep	MPMEAS_NUMSTEP?	numstep
Multiple Power Measurement - Power Step Time	MPMEAS_STEPTIME steptime	MPMEAS_STEPTIME?	data
Multiple Power Measurement - Trigger Timeout	MPMEAS_TIMEOUT timeout	MPMEAS_TIMEOUT?	timeout
Multiple Power Measurement - Trigger Level	MPMEAS_TRG_LVL level	MPMEAS_TRG_LVL?	level
Multiple Power Measurement - Input Level Control	MPMEAS_TXREF s[,ref(0)[,n(1),ref(1)[,…[,n(i) ,ref(i)],…]]	MPMEAS_TXREF?	s,ref(0),n(1),ref(1),n(2),ref(2),…

Multiple Power Result

Function	Command	Query	Response
Multiple Power Measurement - Level	-----	MRFPWR? pos,num	l(i)

Narrowband Parameters

Function	Command	Query	Response
Narrowband Power vs Time - Measurement Window Offset and Measurement Window	NBANDPVT_MW offset,meas_window	NBANDPVT_MW?	offset,meas_window
Narrowband Power vs Time - Segment Duration and Number of Segments	NBANDPVT_SEG duration,num	NBANDPVT_SEG?	duration,num
Narrowband Power vs Time - Trigger Timeout	NBANDPVT_TIMEOUT timeout	NBANDPVT_TIMEOUT?	timeout

Narrowband Result

Function	Command	Query	Response
Narrowband Power vs Time - Measurement Result	-----	NBANDPVT_POWER?	p(i)

Tx/Rx vs. Frequency Parameters

Function	Command	Query	Response
Tx/Rx vs. Frequency Measurement - Registration of Mobile Rx Power	REGMRXPWR p(n)	REGMRXPWR?	p(n)
Tx/Rx vs. Frequency Measurement - Registration of Mobile Rx Power	REGMRXPWR2 p(n)	REGMRXPWR2?	p(n)
Tx/Rx vs. Frequency Measurement - Input Level Control	REGMTXREF s[,ref(0)[,n(1),ref(1)[,… [n(99),ref(99)]…]]]	REGMTXREF?	s,ref(0),…,n(99),ref(99)

Tx/Rx vs. Frequency Parameters (Cont'd)

Function	Command	Query	Response
Tx/Rx vs. Frequency Measurement - Registration of Tx/Rx Frequency	REGTX_RX_FREQ dlfreq(0),ulfreq(0)[,dlfreq(1),ulfreq(1)[,…[,dlfreq(399),ulfreq(399)]…]]	REGTX_RX_FREQ?	dlfreq(0),ulfreq(0),…,dlfreq(399),ulfreq(399)
	REGTX_RX_FREQ2 dlfreq(10),ulfreq(10)[,dlfreq(11),ulfreq(11)[,…[,dlfreq(19),ulfreq(19)]…]]	REGTX_RX_FREQ2?	dlfreq(0),ulfreq(0),…,dlfreq(n),ulfreq(n)
	REGTX_RX_FREQ3 dlfreq(20),ulfreq(20)[,dlfreq(21),ulfreq(21)[,…[,dlfreq(29),ulfreq(29)]…]]	REGTX_RX_FREQ3?	dlfreq(0),ulfreq(0),…,dlfreq(n),ulfreq(n)
	REGTX_RX_FREQ4 dlfreq(30),ulfreq(30)[,dlfreq(31),ulfreq(31)[,…[,dlfreq(39),ulfreq(39)]…]]	REGTX_RX_FREQ4?	dlfreq(0),ulfreq(0),…,dlfreq(n),ulfreq(n)
	REGTX_RX_FREQ5 dlfreq(40),ulfreq(40)[,dlfreq(41),ulfreq(41)[,…[,dlfreq(49),ulfreq(49)]…]]	REGTX_RX_FREQ5?	dlfreq(40),ulfreq(40),…,dlfreq(49),ulfreq(49)

Tx/Rx vs. Frequency Parameters (Cont'd)

Function	Command	Query	Response
Tx/Rx vs. Frequency Measurement - Registration of Tx/Rx Frequency	REGTX_RX_FREQ6 dlfreq(50),ulfreq(50)[,dlfreq(51),ulfreq(51)[,…[,dlfreq(59),ulfreq(59)]…]]	REGTX_RX_FREQ6?	dlfreq(50),ulfreq(50),…,dlfreq(59),ulfreq(59)
	REGTX_RX_FREQ7 dlfreq(60),ulfreq(60)[,dlfreq(61),ulfreq(61)[,…[,dlfreq(69),ulfreq(69)]…]]	REGTX_RX_FREQ7?	dlfreq(60),ulfreq(60),…,dlfreq(69),ulfreq(69)
	REGTX_RX_FREQ8 dlfreq(70),ulfreq(70)[,dlfreq(71),ulfreq(71)[,…[,dlfreq(79),ulfreq(79)]…]]	REGTX_RX_FREQ8?	dlfreq(70),ulfreq(70),…,dlfreq(79),ulfreq(79)
	REGTX_RX_FREQ9 dlfreq(80),ulfreq(80)[,dlfreq(81),ulfreq(81)[,…[,dlfreq(89),ulfreq(89)]…]]	REGTX_RX_FREQ9?	dlfreq(80),ulfreq(80),…,dlfreq(89),ulfreq(89)
	REGTX_RX_FREQ10 dlfreq(90),ulfreq(90)[,dlfreq(91),ulfreq(91)[,…[,dlfreq(99),ulfreq(99)]…]]	REGTX_RX_FREQ10?	dlfreq(90),ulfreq(90),…,dlfreq(99),ulfreq(99)

Tx/Rx vs. Frequency Parameters (Cont'd)

Function	Command	Query	Response
Tx/Rx vs. Frequency Measurement - Registration of Tx/Rx Frequency	REGTX_RX_FREQ11 dlfreq(100),ulfreq(100)[,dlfreq(101),ulfreq(101)[,…[,dlfreq(109),ulfreq(109)]…]]	REGTX_RX_FREQ11?	dlfreq(100),ulfreq(100),…,dlfreq(109),ulfreq(109)
	REGTX_RX_FREQ12 dlfreq(110),ulfreq(110)[,dlfreq(111),ulfreq(111)[,…[,dlfreq(119),ulfreq(119)]…]]	REGTX_RX_FREQ12?	dlfreq(110),ulfreq(110),…,dlfreq(119),ulfreq(119)
	REGTX_RX_FREQ13 dlfreq(120),ulfreq(120)[,dlfreq(121),ulfreq(121)[,…[,dlfreq(129),ulfreq(129)]…]]	REGTX_RX_FREQ13?	dlfreq(120),ulfreq(120),…,dlfreq(129),ulfreq(129)
	REGTX_RX_FREQ14 dlfreq(130),ulfreq(130)[,dlfreq(131),ulfreq(131)[,…[,dlfreq(139),ulfreq(139)]…]]	REGTX_RX_FREQ14?	dlfreq(130),ulfreq(130),…,dlfreq(139),ulfreq(139)
	REGTX_RX_FREQ15 dlfreq(140),ulfreq(140)[,dlfreq(141),ulfreq(141)[,…[,dlfreq(149),ulfreq(149)]…]]	REGTX_RX_FREQ15?	dlfreq(140),ulfreq(140),…,dlfreq(149),ulfreq(149)

Tx/Rx vs. Frequency Parameters (Cont'd)

Function	Command	Query	Response
Tx/Rx vs. Frequency Measurement - Registration of Tx/Rx Frequency	REGTX_RX_FREQ16 dlfreq(150),ulfreq(150)[,dlfreq(151),ulfreq(151)[,…[,dlfreq(159),ulfreq(159)]…]]	REGTX_RX_FREQ16?	dlfreq(150),ulfreq(150),…,dlfreq(159),ulfreq(159)
	REGTX_RX_FREQ17 dlfreq(160),ulfreq(160)[,dlfreq(161),ulfreq(161)[,…[,dlfreq(169),ulfreq(169)]…]]	REGTX_RX_FREQ17?	dlfreq(160),ulfreq(160),…,dlfreq(169),ulfreq(169)
	REGTX_RX_FREQ18 dlfreq(170),ulfreq(170)[,dlfreq(171),ulfreq(171)[,…[,dlfreq(179),ulfreq(179)]…]]	REGTX_RX_FREQ18?	dlfreq(170),ulfreq(170),…,dlfreq(179),ulfreq(179)
	REGTX_RX_FREQ19 dlfreq(180),ulfreq(180)[,dlfreq(181),ulfreq(181)[,…[,dlfreq(189),ulfreq(189)]…]]	REGTX_RX_FREQ19?	dlfreq(180),ulfreq(180),…,dlfreq(189),ulfreq(189)
	REGTX_RX_FREQ20 dlfreq(190),ulfreq(190)[,dlfreq(191),ulfreq(191)[,…[,dlfreq(199),ulfreq(199)]…]]	REGTX_RX_FREQ20?	dlfreq(190),ulfreq(190),…,dlfreq(199),ulfreq(199)

Tx/Rx vs. Frequency Parameters (Cont'd)

Function	Command	Query	Response
Tx/Rx vs. Frequency Measurement - Registration of Tx/Rx Frequency	REGTX_RX_FREQ21 dlfreq(200),ulfreq(200)[, dlfreq(201),ulfreq(201)[, …[,dlfreq(209),ulfreq(209)]…]]	REGTX_RX_FREQ21?	dlfreq(200),ulfreq(200),… ,dlfreq(209),ulfreq(209)
	REGTX_RX_FREQ22 dlfreq(210),ulfreq(210)[, dlfreq(211),ulfreq(211)[, …[,dlfreq(219),ulfreq(219)]…]]	REGTX_RX_FREQ22?	dlfreq(210),ulfreq(210),… ,dlfreq(219),ulfreq(219)
	REGTX_RX_FREQ23 dlfreq(220),ulfreq(220)[, dlfreq(221),ulfreq(221)[, …[,dlfreq(229),ulfreq(229)]…]]	REGTX_RX_FREQ23?	dlfreq(220),ulfreq(220),… ,dlfreq(229),ulfreq(229)
	REGTX_RX_FREQ24 dlfreq(230),ulfreq(230)[, dlfreq(231),ulfreq(231)[, …[,dlfreq(239),ulfreq(239)]…]]	REGTX_RX_FREQ24?	dlfreq(230),ulfreq(230),… ,dlfreq(239),ulfreq(239)
	REGTX_RX_FREQ25 dlfreq(240),ulfreq(240)[, dlfreq(241),ulfreq(241)[, …[,dlfreq(249),ulfreq(249)]…]]	REGTX_RX_FREQ25?	dlfreq(240),ulfreq(240),… ,dlfreq(249),ulfreq(249)

Tx/Rx vs. Frequency Parameters (Cont'd)

Function	Command	Query	Response
Tx/Rx vs. Frequency Measurement - Registration of Tx/Rx Frequency	REGTX_RX_FREQ26 dlfreq(250),ulfreq(250)[, dlfreq(251),ulfreq(251)[, …[,dlfreq(259),ulfreq(259)]…]]	REGTX_RX_FREQ26?	dlfreq(250),ulfreq(250),…,dlfreq(259),ulfreq(259)
	REGTX_RX_FREQ27 dlfreq(260),ulfreq(260)[, dlfreq(261),ulfreq(261)[, …[,dlfreq(269),ulfreq(269)]…]]	REGTX_RX_FREQ27?	dlfreq(260),ulfreq(260),…,dlfreq(269),ulfreq(269)
	REGTX_RX_FREQ28 dlfreq(270),ulfreq(270)[, dlfreq(271),ulfreq(271)[, …[,dlfreq(279),ulfreq(279)]…]]	REGTX_RX_FREQ28?	dlfreq(270),ulfreq(270),…,dlfreq(279),ulfreq(279)
	REGTX_RX_FREQ29 dlfreq(280),ulfreq(280)[, dlfreq(281),ulfreq(281)[, …[,dlfreq(289),ulfreq(289)]…]]	REGTX_RX_FREQ29?	dlfreq(280),ulfreq(280),…,dlfreq(289),ulfreq(289)
	REGTX_RX_FREQ30 dlfreq(290),ulfreq(290)[, dlfreq(291),ulfreq(291)[, …[,dlfreq(299),ulfreq(299)]…]]	REGTX_RX_FREQ30?	dlfreq(290),ulfreq(290),…,dlfreq(299),ulfreq(299)

Tx/Rx vs. Frequency Parameters (Cont'd)

Function	Command	Query	Response
Tx/Rx vs. Frequency Measurement - Registration of Tx/Rx Frequency	`REGTX_RX_FREQ31 dlfreq(300),ulfreq(300)[,dlfreq(301),ulfreq(301)[,…[,dlfreq(309),ulfreq(309)]…]]`	`REGTX_RX_FREQ31?`	`dlfreq(300),ulfreq(300),…,dlfreq(309),ulfreq(309)`
	`REGTX_RX_FREQ32 dlfreq(310),ulfreq(310)[,dlfreq(311),ulfreq(311)[,…[,dlfreq(319),ulfreq(319)]…]]`	`REGTX_RX_FREQ32?`	`dlfreq(310),ulfreq(310),…,dlfreq(319),ulfreq(319)`
	`REGTX_RX_FREQ33 dlfreq(320),ulfreq(320)[,dlfreq(321),ulfreq(321)[,…[,dlfreq(329),ulfreq(329)]…]]`	`REGTX_RX_FREQ33?`	`dlfreq(320),ulfreq(320),…,dlfreq(329),ulfreq(329)`
	`REGTX_RX_FREQ34 dlfreq(330),ulfreq(330)[,dlfreq(331),ulfreq(331)[,…[,dlfreq(339),ulfreq(339)]…]]`	`REGTX_RX_FREQ34?`	`dlfreq(330),ulfreq(330),…,dlfreq(339),ulfreq(339)`
	`REGTX_RX_FREQ35 dlfreq(340),ulfreq(340)[,dlfreq(341),ulfreq(341)[,…[,dlfreq(349),ulfreq(349)]…]]`	`REGTX_RX_FREQ35?`	`dlfreq(340),ulfreq(340),…,dlfreq(349),ulfreq(349)`

Tx/Rx vs. Frequency Parameters (Cont'd)

Function	Command	Query	Response
Tx/Rx vs. Frequency Measurement - Registration of Tx/Rx Frequency	REGTX_RX_FREQ36 dlfreq(350),ulfreq(350)[,dlfreq(351),ulfreq(351)[,…[,dlfreq(359),ulfreq(359)]…]]	REGTX_RX_FREQ36?	dlfreq(350),ulfreq(350),…,dlfreq(359),ulfreq(359)
	REGTX_RX_FREQ37 dlfreq(360),ulfreq(360)[,dlfreq(361),ulfreq(361)[,…[,dlfreq(369),ulfreq(369)]…]]	REGTX_RX_FREQ37?	dlfreq(360),ulfreq(360),…,dlfreq(369),ulfreq(369)
	REGTX_RX_FREQ38 dlfreq(370),ulfreq(370)[,dlfreq(371),ulfreq(371)[,…[,dlfreq(379),ulfreq(379)]…]]	REGTX_RX_FREQ38?	dlfreq(370),ulfreq(370),…,dlfreq(379),ulfreq(379)
	REGTX_RX_FREQ39 dlfreq(380),ulfreq(380)[,dlfreq(381),ulfreq(381)[,…[,dlfreq(389),ulfreq(389)]…]]	REGTX_RX_FREQ39?	dlfreq(380),ulfreq(380),…,dlfreq(389),ulfreq(389)
	REGTX_RX_FREQ40 dlfreq(390),ulfreq(390)[,dlfreq(391),ulfreq(391)[,…[,dlfreq(399),ulfreq(399)]…]]	REGTX_RX_FREQ40?	dlfreq(390),ulfreq(390),…,dlfreq(399),ulfreq(399)
Tx/Rx vs. Frequency Measurement - Filter	TX_RX_FLT filter	TX_RX_FLT?	filter

Tx/Rx vs. Frequency Parameters (Cont'd)

Function	Command	Query	Response
Tx/Rx vs. Frequency Measurement - Invalid Result Output	TX_RX_INV_RSLT_OUT on_off	TX_RX_INV_RSLT_OUT?	on_off
Tx/Rx vs. Frequency Measurement - Measurement Window Offset & Measurement Window	TX_RX_MW offset,meas_window	TX_RX_MW?	offset,meas_window
Tx/Rx vs. Frequency Measurement - Segment Number	TX_RX_NUMSEG seg	TX_RX_NUMSEG?	seg
Tx/Rx vs. Frequency Measurement - Sequence Number	TX_RX_NUMSEQ seq	TX_RX_NUMSEQ?	seq
Tx/Rx vs. Frequency Measurement - Segment Duration	TX_RX_SEG_DURATION duration	TX_RX_SEG_DURATION?	duration
Tx/Rx vs. Frequency Measurement - Trigger Timeout	TX_RX_TIMEOUT timeout	TX_RX_TIMEOUT?	timeout
Tx/Rx vs. Frequency Measurement - Trigger Delay	TX_RX_TRG_DLY delay	TX_RX_TRG_DLY?	delay
Tx/Rx vs. Frequency Measurement - Trigger Level	TX_RX_TRG_LVL level	TX_RX_TRG_LVL?	level

Tx/Rx vs. Frequency Results

Function	Command	Query	Response
Tx/Rx vs. Frequency measurement – Level	-----	TX_RX_FREQ?	l(i),l(1),…,l(i)
Tx/Rx vs. Frequency measurement – Valid number of sequences and segments	-----	TX_RX_FREQ_NUM?	n,seg,seq

IQ Capture Parameter

Function	Command	Query	Response
IQ Capture - Measurement Bandwidth	IQCAP_BW bw	IQCAP_BW?	bw
IQ Capture - Trigger Timeout	IQCAP_TIMEOUT time	IQCAP_TIMEOUT?	time
IQ Capture - Trigger Delay	IQCAP_TRGDLY delay	IQCAP_TRGDLY?	delay
IQ Capture - Trigger Level	IQCAP_TRGLVL level	IQCAP_TRGLVL?	level
IQ Capture - Time Span	IQCAP_TSPAN tspan	IQCAP_TSPAN?	tspan

IQ Capture Result

Function	Command	Query	Response
IQ Capture - IQ Data	-----	IQCAP_BIN? type,start,num	#XY<Y byte binary data><terminater>
IQ Capture - Number of Samples	-----	IQCAP_NUM?	sample
IQ Capture - Sampling Rate	-----	IQCAP_RATE?	rate

5.1.3 Sequence measurement commands

Common Parameters

Function	Command	Query	Response
Input Level	ILVL level	ILVL?	level
Output Level	OLVL level	OLVL?	level
Uplink Frequency	ULFREQ ul_freq	ULFREQ?	ul_freq
Downlink Frequency	DLFREQ dl_freq	DLFREQ?	dl_freq
Downlink Frequency	RXFREQ dl_freq	RXFREQ?	dl_freq
Uplink Frequency	TXFREQ ul_freq	TXFREQ?	ul_freq
Trigger Timeout	TRGTOUT time	TRGTOUT?	time

Sequence Measurements

Function	Command	Query	Response
Sequence Measurement Status	-----	SEQMSTAT?	m_status,n,s(0),s(1),…,s(n-1)
Sequence Progress	-----	SEQPROGRESS?	p,cur,start,end
Specified Segment Status	-----	SEQSEGSTAT? seg	stat

Sequence Control Parameters

Function	Command	Query	Response
Sequence Control Parameter - Sequence Control	SEQCTRL start,end	SEQCTRL?	start,end
Sequence Control Parameter - Sequence Control	SEQCTRLTX start,end	SEQCTRLTX?	start,end
Start Signal Analyzer Measurement Only	SEQEXECTX	-----	-----
Sequence Control Parameter - Sequence End State Reinitialization	SEQREINIT sw	SEQREINIT?	sw
Sequence Control Parameter - Sequence Table	SEQTBL table	SEQTBL?	table

Sequence Parameter Information

Function	Command	Query	Response
Sequence Parameter Information - Error Check	-----	SEQERR? [item]	n,err(0),err(1),…,err(n-1) ns,seg(0),seg(1),…,seg(ns-1) e,mem,exe,set
Sequence Parameter Information - Error Check	-----	SEQERR2? format	n,err(n-1)

Sequence Table Parameters

Function	Command	Query	Response
Sequence Table Parameter - Measurement	SEQMEAS seg,mode,step,mcond	SEQMEAS? seg	mode,step,mcond
Sequence Table Parameter - SG Output Port	SEQSGPORT seg,port	SEQSGPORT? seg	port
Sequence Table Parameter - Trigger	SEQTRG seg,src,slope,level,delay	SEQTRG? seg	src,slope,level,delay
Sequence Table Parameter - TRX Control	SEQTRX seg,ul_freq,ref,dl_freq,level,pat	SEQTRX? seg	ul_freq,ref,dl_freq,level,pat
Sequence Table Parameter - Uplink Frequency, Input Level	SEQTX seg,ul_freq,ref	SEQTX? seg	ul_freq,ref

Tx Power Measurement Condition Parameters

Function	Command	Query	Response
Tx Power - Bandwidth	TXPWR_BW bw	TXPWR_BW?	bw
Tx Power - Measurement Window Offset and Window Length	TXPWR_MW offset,mw	TXPWR_MW?	offset,mw
Tx Power - Output Level Pattern Select	TXPWR_OLVL mcond,pat	TXPWR_OLVL? mcond	pat
Tx Power - Step Count	TXPWR_SCOUNT mcond,count	TXPWR_SCOUNT? mcond	count
Tx Power - Step Time	TXPWR_STIME stime	TXPWR_STIME?	stime

Tx Power Result Command

Function	Command	Query	Response
Tx Power - Power	-----	TXPWR_PWR? seg[,mode]	{s,p(0),p(1),…,p(s-1)}|p_ave
Tx Power - Power	-----	TXPWR_PWR_ALL? [mode]	{s1,p(0),p(1),…,p(s1-1)}|{s2,p_ave(0),p_ave(1),…,p_ave(s2-1)}

Tx Power Measurement Condition Parameters

Function	Command	Query	Response
Tx Power - System Output Level Pattern Definition (0 to 99)	TXPWR_OPAT0 pat,level(0)[,level(1)[,…[,level(99)]…]]	TXPWR_OPAT0? pat	Level(0),level(1),…,level(99)
Tx Power - System Output Level Pattern Definition (50 to 99)	TXPWR_OPAT1 pat,level(50)[,level(51)[,…[,level(99)]…]]	TXPWR_OPAT1? pat	Level(50),level(51),…,level(99)

5.2 Details of Commands

This section describes commands in alphabetic order.

■ Terms in this command list

EX ....Command name (header)

Example ....Command function name

Function ....Command function

Command.................................Programming command syntax

Query ....Query syntax

Response ....Response syntax

Parameter ....Parameter definition

Details ....Command restrictions and others

Example of Use................................Command usage example

Related Commands ....Introduction of related commands

■ Suffix Code list

Suffix Code	Unit	Suffix Code	Unit
DB	dB	MHZ	MHz
DBM	dBm	MS	ms
GZ	GHz	MZ	MHz
GHZ	GHz	NS	ns
HZ	Hz	S	s
KZ	kHz	US	μs
KHZ	kHz		

5.2.1 Common commands

DLPAT

Waveform Pattern Select

Function

Selects waveform pattern to use from patterns included in waveform pattern file and queries currently selected waveform pattern
When the command received, the signal is immediately switched regardless of the frame cycle of signal, so the frame cycle is not continued.

Command

```
DLPAT pat
```

Query

```
DLPAT?
```

Response

pat

Parameter

pat	Waveform pattern
PAT1 to PATn	Pattern number (n: waveform information file group range)
Default	PAT1

Details

Select the waveform pattern for RF output signal in waveform file.
The pattern number is the same as the group number. Refer to Chapter 3, "Waveform File Details" in the *Waveform Files for Cellular Application Operation Manual*.

Example of Use

To set the waveform pattern 1:
DLPAT PAT1
DLPAT?
> PAT1

Related Command

Waveform file for arbitrary waveform signal selection or query
PACKAGE

Remarks

The group range depends on the selected waveform file.
For the waveform pattern details, refer to Chapter 3, "Waveform File Details" in the *Waveform Files for Cellular Application Operation Manual.*

DLPAT_SYNC

Waveform Pattern Select (SYNC)

Function

Selects waveform pattern to use from patterns included in waveform pattern file and queries currently selected waveform pattern

When the command received, the signal is switched according to the frame cycle of signal so that the frame cycle is continued.

Command

```
DLPAT_SYNC pat
```

Query

```
DLPAT_SYNC?
```

Response

pat

Parameter

pat	Waveform pattern
PAT1 to PATn	Pattern number (n: waveform information file group range)
Default	PAT1

Details

Select the waveform pattern for RF output signal in waveform file.

The pattern number is the same as the group number. Refer to Chapter 3, “Waveform File Details” in the *Waveform Files for Cellular Application Operation Manual.*

Example of Use

To set the waveform pattern 1:

DLPAT_SYNC PAT1

DLPAT_SYNC?

> PAT1

Related Command

Waveform file for arbitrary waveform signal selection or query

PACKAGE

Remarks

The group range depends on the selected waveform file.

For the waveform pattern details, refer to Chapter 3, “Waveform File Details” in the *Waveform Files for Cellular Application Operation Manual.*

ESR2?

End Event Status (Measurement) Register Query

Function

Queries end event status register (measurement)
The event occurrence can be identified using the retrieved value.

Query

ESR2?

Response

register	Value = bit0 + bit1 + ... + bit7
bit0 = 2^0 = 1	End of measurement
bit1 = 2^1 = 2	Trigger preparation completed
bit2 = 2^2 = 4	Unused (reserved for application use)
bit3 = 2^3 = 8	Unused (reserved for application use)
bit4 = 2^4 = 16	Unused (reserved for application use)
bit5 = 2^5 = 32	Unused (reserved for application use)
bit6 = 2^6 = 64	Unused (reserved for application use)
bit7 = 2^7 = 128	Unused (reserved for application use)

Parameter

register	End event status register (measurement)
Range	0 to 255

Details

The sum of the values for bits of the occurring event from the values $2^0 = 1$, $2^1 = 2$, $2^2 = 4$, $2^3 = 8$, $2^4 = 16$, $2^5 = 32$, $2^6 = 64$, and $2^7 = 128$, that correspond to the end event status register (measurement) bits 0, 1, 2, 3, 4, 5, 6, and 7 becomes the response.

Example of Use

To query the end event status register (measurement) value:
ESR2?
> 0

ESR3?

Error Event Status (Measurement) Register Query

Function

Queries error event status register (measurement)
The event occurrence can be identified using the retrieved value.

Query

ESR3?

Response

register	Value = bit0 + bit1 + ... + bit7
bit0 = 2^0 = 1	Level over
bit1 = 2^1 = 2	Level under
bit2 = 2^2 = 4	Timeout
bit3 = 2^3 = 8	Unused (reserved for application use)
bit4 = 2^4 = 16	Unused (reserved for application use)
bit5 = 2^5 = 32	Unused (reserved for application use)
bit6 = 2^6 = 64	Unused (reserved for application use)
bit7 = 2^7 = 128	Unused (reserved for application use)

Parameter

register	Error event status register (measurement)
Range	0 to 255

Details

The sum of the values for bits of the occurring event from the values $2^0 = 1$, $2^1 = 2$, $2^2 = 4$, $2^3 = 8$, $2^4 = 16$, $2^5 = 32$, $2^6 = 64$, and $2^7 = 128$, that correspond to the end event status register (measurement) bits 0, 1, 2, 3, 4, 5, 6, and 7 becomes the response.

Example of Use

To query the error event status register (measurement) value:
ESR3?
> 4

5

Native Command Reference

LVL

Output Level On/Off

Function

Sets or queries MU887000A RF signal output ON/OFF

Command

```
LVL on_off
```

Query

```
LVL?
```

Response

on_off

Parameter

on_off	RF signal output ON/OFF
ON	Outputs RF signal
OFF	Stops RF signal output
Default	ON

Example of Use

To output RF signals at MU887000A connector:

LVL ON

LVL?

> ON

MEASSTOP

Stop Measure

Function

Stops measurement

Command

```
MEASSTOP
```

Example of Use

To stop measurement:

MEASSTOP

MOD

Output Signal Modulation

Function

Sets or queries MU887000A RF signal output modulation

Command

```
MOD On_Off
```

Query

```
MOD?
```

Response

on_off

Parameter

on_off	Modulation setting
ON	Sets RF output signal modulation ON
OFF	Sets RF output signal modulation OFF (CW)
Default	ON

Example of Use

To set modulate the RF signal:

MOD ON

MOD?

> ON

MSTAT?

Measurement Status

Function

Queries measurement status

Query

```
MSTAT?
```

Response

state

Parameters

state	Measurement status
0	Measurement completed successfully
2	Level over
3	Under level
4	Measurement failed
5	Synchronization word not detected
9	Measurement in progress or not measured
12	Timeout of Tx measurement
13	Rx measurement failed

Details

This command can be used while the measurement is in progress or suspended.
The value received from MX887010A is 0, 2, 9, or 12.

Example of Use

To query current measurement status:
MSTAT?
> 0

PACKAGE

Waveform File Select

Function

Sets or queries waveform pattern file for any waveform signals

Command

`PACKAGE pac`

Query

`PACKAGE?`

Response

pac

Parameter

pac	Waveform file name

Details

The command selects the file name from the waveform file loaded into the waveform memory.

Example of Use

To select waveform file from waveform files loaded into memory:
PACKAGE “PAC1”
PACKAGE?
> PAC1

Related Command

Use the following command to load the pattern file into waveform memory.
SOUR:GPRF:GEN:ARB:FILE:LOAD
For details of the commands, refer to Chapter 5 “SCPI Command Reference” in the *MU887000A TRX Test Module Operation Manual*.
:SOURce:GPRF:GENerator:ARB:FILE:LOAD
The following command can be used to query the file names of pattern files 0 to 3 been loaded into waveform memory.
SOUR:GPRF:GEN:ARB:WAV:NAME?
For details of the commands, refer to Chapter 5 “SCPI Command Reference” in the *MU887000A TRX Test Module Operation Manual*.
:SOURce:GPRF:GENerator:ARB:WAVeform:NAME?
Use the following commands to select the pattern to use from the waveform patterns included in the pattern file configured using the command described in this section.
DLPAT, DLPAT_SYNC, SEQTRX

PORT

Set Connect Port Direction

Function

Sets or queries connector settings for inputting and outputting RF signals

Command

```
PORT input,output
```

Query

```
PORT?
```

Response

input,output

Parameters

input	Test Port No.
PORT1	Test Port1
PORT2	Test Port2
PORT3	Test Port3
PORT4	Test Port4
Default	PORT1
output	Test Port No.
PORT1	Test Port1
PORT2	Test Port2
PORT3	Test Port3
PORT4	Test Port4
Default	PORT1

Details

Both Test Port1 and Test Port2 can be set to input and output simultaneously.
Test Port3 and Test Port4 can be set to either input or output at one time.

Example of Use

To set Test Port1 as RF signal input connector and Test Port2 as RF signal output connector:

PORT PORT1,PORT2
PORT?
> PORT1,PORT2

SNGLS

Measurement Start

Function

Sets the parameters for both specified measurement and signal transmission and executes measurement.

Command

```
SNGLS
```

Example of Use

To start measurement:

SNGLS

Related command

ESR2

For the details of the event status register, refer to Chapter 3 “Fundamental Operation” in the *MU887000A TRX Test Module Operation Manual.*

STDSEL

Standard Select

Function

Sets or queries measurement standard

Command

```
STDSEL std
```

Query

```
STDSEL?
```

Response

std

Parameter

std	Measurement standard	
COMMON	Common measurement	(requires MX887010A)
WCDMA	W-CDMA	(requires MX887011A)
GSM	GSM	(requires MX887012A)
LTE	LTE	(requires MX887013A or MX887014A)
CDMA2000	CDMA2000	(requires MX887015A)
EVDO	EVDO	(requires MX887016A)
TDSCDMA	TD-SCDMA	(requires MX887017A)
SEQUENCE	Sequence measurement	(requires MX870010A)
SEQ	Sequence measurement	(requires MX870010A)
Default	COMMON	

Details

This command selects the measurement standard depending on the application software or sequence measurement.
Sending this command during measurement, aborts measurement to switch the measurement standard.

Example of Use

To switch the measurement standard to GSM:
STDSEL GSM
STDSEL?
> GSM

Remarks

If the measurement standard is switched, the pre-switching measurement results are cleared.

SYSSEL

Application Select

Function

Sets or queries type of application software

Command

```
SYSSEL app
```

Query

```
SYSSEL?
```

Response

app

Parameter

app	Type of application software
CELLULAR	When using MX887010A, MX887011A, MX887012A, MX887013A, MX887014A, MX887015A, MX887016A or MX887017A
SRW	When using If MX887030A, MX887031A, MX887040A, or MX887050A

Details

Set the parameter to CELLULAR and send the command before using the MX887010A features.

Example of Use

SYSSEL CELLULAR
SYSSEL?
> CELLULAR

Remarks

Set the parameter to CELLULAR using SYSSEL, and then set the measurement standard using STDSEL.
If the parameter has been set to COMMON using STDSEL, set the measurement items using MEASSEL.

SYST:LANG

Language Selection of Remote Command

Function

Switches language mode of remote control command

Command

```
SYST:LANG mode
```

Query

```
SYST:LANG?
```

Response

mode

Parameter

mode	Language mode
NAT	Native
SCPI	SCPI
Default	NAT

Example of Use

SYST:LANG NAT
SYST:LANG?
>NAT

5.2.2 Fundamental measurement commands

DLFREQ

Downlink Frequency

Function

Sets or queries MU887000A downlink frequency

Command

```
DLFREQ dl_freq
```

Query

```
DLFREQ?
```

Response

dl_freq
No suffix code, units: Hz

Parameter

dl_freq	Downlink frequency
Range	400.000000 to 6000.000000 MHz
Resolution	1 Hz
Suffix code	HZ, KHZ, KZ, MHZ, MZ, GHZ, GZ (uses Hz when omitted)
Default	1000.000000 MHz

Examples of Use

To set the downlink frequency to 2050 MHz:
DLFREQ 2050MHZ

To query the currently configured downlink frequency:
DLFREQ?
>2050000000

Remarks

Changing the setting of the downlink frequency does not change the setting of the downlink channel.

ILVL

Input Level

Function

Sets or queries input level of MU887000A connector

Command

```
ILVL level
```

Query

```
ILVL?
```

Response

level

Unit	dBm

Parameter

level	Input level
Range	–65.0 to +35.0 dBm (Port1/Port2)
	–65.0 to +25.0 dBm (Port3/Port4)
Resolution	0.1 dB
Suffix code	DBM (uses dBm when omitted)
Default	–10.0 dBm

Details

The setting range varies with the input port setting.
When the Cable Loss Calibration is ON, the cable loss is added to the input level setting range.
When the cable loss is 5 dB, the Port1/Port2 setting range is –60.0 to +40.0 dBm.

Examples of Use

To set the input level to –10.0 dBm:
ILVL -10.0

To query the currently configured input level:
ILVL?
>-10.0

Related Commands

EXTLOSSW, LOSSTBL, LOSSTBLVAL
For details of the commands, refer to Chapter 6 "Native Command Reference" in the *MU887000A TRX Test Module Operation Manual*.

IQCAP_BIN?

IQ Capture - IQ Data

Function

Queries the captured IQ data. Response is returned in binary data.

Query

`IQCAP_BIN? type,start,num`

Response

#XY<Y byte binary data><terminator>

X and Y are ASCII characters. The X value is the digit number of the Y value. If the Y value is 12500, the X value is 5.
The binary data <Y byte binary data> is output in the order of i(0),q(0),i(1),q(1),...,i(num–1),q(num–1) in 32bit floating type.

Parameter

type	Type
Range	2
Resolution	1
start	Offset position to start reading
Range	0 to 399999 (Maximum value: (Number of captured samples) – 1)
Resolution	1
num	Number of samples to read out
Range	1 to 400000
Resolution	1
i(n)	n'th I data
q(n)	n'th Q data
terminater	terminater

Details

If the range specified by the start position and the data length is greater than the number of captured samples, then the data of the interval that does not contain IQ data becomes 0.

Examples of Use

To read the captured IQ data of 10,000 samples from the 0th sample.
IQCAP_BIN? 2,0,10000

Related Command

IQCAP_RATE	Queries the sampling rate of IQ Capture
IQCAP_NUM	Queries the number of samples captured by IQ Capture

IQCAP_BW

IQ Capture - Measurement Bandwidth

Function

Sets or queries the measurement bandwidth for IQ Capture

Command

`IQCAP_BW bw`

Query

`IQCAP_BW?`

Response

`bw`

Parameter

bw	Measurement bandwidth
20MHZ	20 MHz
5MHZ	5 MHz
3MHZ	3 MHz
1MHZ	1 MHz
500KHZ	500 kHz
300KHZ	300 kHz
100KHZ	100 kHz
GSM	GSM (Gauss 1 MHz)
Default	20MHZ

Examples of Use

To set the measurement bandwidth for IQ Capture to 20 MHz:

IQCAP_BW 20MHZ

IQCAP_BW?

>20MHZ

IQCAP_NUM?

IQ Capture - Number of Samples

Function

Queries the number of samples captured by IQ Capture

Query

`IQCAP_NUM?`

Response

`sample`

Parameter

sample	Number of captured samples
Range	200 to 400000
Resolution	1

Examples of Use

Queries the number of samples captured by IQ Capture:

IQCAP_NUM?

>200

IQCAP_RATE?

IQ Capture - Sampling Rate

Function

Queries the sampling rate for IQ Capture

Query

`IQCAP_RATE?`

Response

`rate`

Unit	MSPS (Mega Sample Per Second)

Parameter

rate	Sampling rate
Range	40.000000,10.000000,5.000000,2.000000,1.000000,0.500000,0.200000, 1.083333 0.000000 when not measured.
Resolution	0.000001

Examples of Use

Queries the sampling rate for IQ Capture:

IQCAP_RATE?

>20.000000

IQCAP_TIMEOUT

IQ Capture - Trigger Timeout

Function

Sets or queries the trigger timeout for IQ Capture

Command

```
IQCAP_TIMEOUT time
```

Query

```
IQCAP_TIMEOUT?
```

Response

```
time
```

Unit	s

Parameter

time	Trigger timeout
Range	1 to 30 s
Resolution	1
Suffix Code	NS, US, MS, S (uses s when omitted)
Default	5

Examples of Use

To set the trigger timeout to 5 s:

IQCAP_TIMEOUT 5

IQCAP_TIMEOUT?

>5

IQCAP_TRGDLY

IQ Capture - Trigger Delay

Function

Sets or queries the trigger delay time for IQ Capture

Command

`IQCAP_TRGDLY delay`

Query

`IQCAP_TRGDLY?`

Response

`delay`

Unit	μs

Parameter

delay	Trigger delay time
Range	–500 to 500
Resolution	1
Suffix Code	NS, US, MS, S (uses μs when omitted)
Default	0

Examples of Use

To set the trigger delay time to 0 μs:

IQCAP_TRGDLY 0

IQCAP_TRGDLY?

>0

IQCAP_TRGLVL

IQ Capture - Trigger Level

Function

Sets or queries the trigger level for IQ Capture

Command

`IQCAP_TRGLVL level`

Query

`IQCAP_TRGLVL?`

Response

`level`

Unit	dB

Parameter

level	Trigger level
Range	–30 to –3
Resolution	1 dB
Suffix Code	DB (uses dB when omitted)
Default	–30

Examples of Use

To set the trigger level to –30 dB:

IQCAP_TRGLVL -30

IQCAP_TRGLVL?

>-30

IQCAP_TSPAN

IQ Capture - Time Span

Function

Sets or queries the time span for IQ Capture

Command

`IQCAP_TSPAN tspan`

Query

`IQCAP_TSPAN?`

Response

`tspan`

Unit	µs

Parameter

tspan	Time span
Range	1000 to 10000
Resolution	1
Suffix Code	NS, US, MS, S (uses µs when omitted)
Default	1000

Examples of Use

To set the time span for IQ Capture to 10 ms:

IQCAP_TSPAN 10000

IQCAP_TSPAN?

>10000

MEASSEL

Measurement Select

Function

Sets or queries measurement functions of MX887000A

Command

```
MEASSEL meassel
```

Query

```
MEASSEL?
```

Response

meassel

Parameter

meassel	Selection of measurement functions
SPMON	Spectrum Monitor
MULTIPWR	Multiple Power
TRXFREQ	Tx/Rx vs. Frequency
NBANDPVT	Narrowband Power vs Time
IQCAP	IQ Capture
Default	SPMON

Example of Use

To set the measurement function to Spectrum monitor:

MEASSEL SPMON

MEASSEL?

> SPMON

MPMEAS_FLT

Multiple Power Measurement - Filter

Function

Sets or queries multiple power measurement filters

Command

`MPMEAS_FLT filter`

Query

`MPMEAS_FLT?`

Response

filter

Parameter

filter	Bandpass filter bandwidth
RRC	RRC 3.84 MHz filter
BW1.4MHZ	BW 1.4 MHz filter
BW3MHZ	BW 3 MHz filter
BW5MHZ	BW 5 MHz filter
BW10MHZ	BW 10 MHz filter
BW15MHZ	BW 15 MHz filter
BW20MHZ	BW 20 MHz filter
CDMA2K	CDMA2K 1.2288 MHz filter
Default	BW5MHZ

Example of Use

To set the filter bandwidth to 5 MHz:

MPMEAS_FLT BW5MHZ

MPMEAS_FLT?

> 5MHZ

MPMEAS_INV_RSLT_OUT

Multiple Power Measurement - Invalid Result Output

Function

Sets or queries display method for measurement results after invalid measurement interval at multiple power measurement

Command

```
MPMEAS_INV_RSLT_OUT on_off
```

Query

```
MPMEAS_INV_RSLT_OUT?
```

Response

on_off

Parameter

on_off	Display method for invalid measurement results
ON	Numeric value
OFF	Invalid value (999.99)
Default	OFF

Details

Power is not measured correctly when the level of a slot with set input level changes. In this case, this command sets the measurement results display. When the ON parameter is set, the actual invalid measurement result value is output as is.

When the OFF parameter is set, the measurement result is displayed as 999.99, indicating the measurement is invalid.

Example of Use

To display the result from the invalid measurement interval as 999.99:

MPMEAS_INV_RSLT_OUT OFF

MPMEAS_INV_RSLT_OUT?

> OFF

MPMEAS_MW

Multiple Power Measurement - Measurement Window Offset & Measurement Window

Function

Sets or queries measurement interval and offset multiple power measurement

Command

```
MPMEAS_MW offset,meas_window
```

Query

```
MPMEAS_MW?
```

Response

offset,meas_window

Parameters

offset	Offset
Range	0 to 75%
Resolution	1%
Default	25%

meas_window	Measurement interval
Range	1 to 90%
Resolution	1%
Default	55%

Details

The offset and the measurement interval are specified as a proportional ratio (%) to the step time.

Set the offset and measurement interval so that the total is less than 100%.

Example of Use

To set the offset of the measurement interval to 10% and the measurement interval to 80%:

MPMEAS_MW 10,80

MPMEAS_MW?

> 10,80

MPMEAS_NUMSTEP

Multiple Power Measurement - Number of Steps

Function

Sets or queries number of steps measured at multiple power measurement

Command

```
MPMEAS_NUMSTEP numstep
```

Query

```
MPMEAS_NUMSTEP?
```

Response

numstep

Parameter

numstep	Number of measurement steps
Range	10 to 100
Resolution	1
Default	30

Example of Use

To set the number of measurement steps to 40:

MPMEAS_NUMSTEP 40

MPMEAS_NUMSTEP?

> 40

MPMEAS_STEPTIME

Multiple Power Measurement - Power Step Time

Function

Sets or queries duration of each step at multiple power measurement

Command

```
MPMEAS_STEPTIME steptime
```

Query

```
MPMEAS_STEPTIME?
```

Response

steptime

Parameter

steptime	Step time width
0.5	0.5 ms
1	1 ms
2	2 ms
4	4 ms
5	5 ms
10	10 ms
20	20 ms
30	30 ms
40	40 ms
50	50 ms
60	60 ms
70	70 ms
80	80 ms
Default	20

Example of Use

To set the step time width to 10 ms:

MPMEAS_STEPTIME 10

MPMEAS_STEPTIME?

> 10

MPMEAS_TIMEOUT

Multiple Power Measurement - Trigger Timeout

Function

Sets or queries trigger timeout at multiple power measurement

Command

```
MPMEAS_TIMEOUT timeout
```

Query

```
MPMEAS_TIMEOUT?
```

Response

timeout

Parameter

timeout	Trigger timeout
Range	1 to 30 s
Resolution	1 s
Default	5 s

Example of Use

To set the trigger timeout to 10 s:

MPMEAS_TIMEOUT 10

MPMEAS_TIMEOUT?

> 10

MPMEAS_TRG_LVL

Multiple Power Measurement - Trigger Level

Function

Sets or queries trigger level at multiple power measurement

Command

`MPMEAS_TRG_LVL level`

Query

`MPMEAS_TRG_LVL?`

Response

level

Parameter

level	Trigger level
Range	–40 to 0 dB
Resolution	1 dB
Default	–30 dB

Example of Use

To set the trigger level to –10 dB:

MPMEAS_TRG_LVL -10

MPMEAS_TRG_LVL?

> -10

MPMEAS_TXREF

Multiple Power Measurement - Input Level Control

Function

Sets or queries control of input levels at multiple power measurement

Command

```
MPMEAS_TXREF s[,ref(0)[,n(1),ref(1)[,…[,n(i) ,ref(i)],…]]
```

Query

```
MPMEAS_TXREF?
```

Response

s,ref(0),n(1),ref(1),n(2),ref(2),...

Parameters

s	Switching the input level control
ON	Input level control enabled
OFF	Input level control disabled
Default	OFF
ref(i)	(i)th input level (dBm)
Range	–65.0 to +35.0 dBm (Port1/Port2) –65.0 to +25.0 dBm (Port3/Port4)
Resolution	0.1 dBm
Suffix code	DBM (uses dBm when omitted)
n(i)	(i)th step number where input level changed
Range	1 to 99
Resolution	1

Details

- The ref(0) and subsequent ref(i) arguments can be omitted when <s> is set to OFF. Note that n(x) and ref(x) should be set or omitted as a pair.
- The input level should be set to ILVL when <s> is set to OFF.
- The n(1) and subsequent n(i) arguments can be omitted when <s> is set to ON. Note that n(x) and ref(x) should be set or omitted as a pair.
- ref(0) is the input level of the first step. Therefore, the segment number n(x) cannot be set.
- When command parameters are omitted, the number of parameters in the query responses must be the same as the number of parameters set by the command.
- n(x) configures the value of (number of measurement steps – 1) or less.

- When cable loss correction is set to ON, the setting range for <ref(i)> must be the range of values with added cable loss.
  Example: If the cable loss is 5 dB, the range between –60.0 and 40.0 dB is used.
  In this case, if the input level is set to –65.0 dB, an "out of parameter setting range" error occurs. (The response to SYSERR? returns 220, meaning "Parameter error".)
  Send SNGLS to query whether the configured level is within the parameter range.

Example of Use

To set the input level control to ON, the input level at the first step to 24 dBm, the input levels at the 20th and subsequent segments to 0 dBm, and the input level at the 30th and subsequent segments to –20 dBm:

MPMEAS_TXREF ON,24,20,0,30, -20

MPMEAS_TXREF?

> ON,24.0,20,0.0,30,-20.0

Related Command

ILVL

MRFPWR?

Multiple Power Measurement – Level

Function

Queries result of average power measurement for each step at multiple power measurement

Query

`MRFPWR? pos,num`

Response

l(1),l(2)...,l(num)

Unit	dBm

Parameters

pos	Step number where query begins
Range	0 to 99
Resolution	1
num	Step count queried
Range	1 to (100 – pos)
Resolution	1
l(num)	Average power of (num)th step
Resolution	0.01 dB
Suffix code	None

Example of Use

To query measurement results for 50 steps beginning at step 1:

MRFPWR? 1,50

> -10.00,999.99,-9.99,…,-10.00

Remarks

If the MPMEAS_INV_RSLT_OUT is set to OFF, an invalid measurement result is returned as 999.99

If the measurement result of the step is level over, the response is 999.99.

NBANDPVT_MW

Narrowband Power vs Time - Measurement Window Offset and Measurement Window

Function

Sets or queries measurement offset and measurement interval for Narrowband Power vs Time measurement

Command

```
NBANDPVT_MW offset,meas_window
```

Query

```
NBANDPVT_MW?
```

Response

offset,meas_window

Parameters

offset	Offset
Range	0 to 90%
Resolution	1%
Default	25%
meas_window	Measurement interval
Range	10 to 100%
Resolution	1%
Default	50%

Details

The offset and measurement interval are specified as a proportional ratio (%) to the segment duration.
Set the offset and the measurement interval so that the total is less than 100%.

Example of Use

To set the offset and measurement interval for Narrowband Power vs Time to 20% and 60%, respectively:
NBANDPVT_MW 20,60
NBANDPVT_MW?
> 20,60

NBANDPVT_POWER?

Narrowband Power vs Time - Measurement Result

Function

Queries average power of each measurement interval at Narrowband Power vs Time measurement

Query

```
NBANDPVT_POWER?
```

Response

p(0),p(1),p(2),...,p(i–1)

Parameter

p(i–1)	Average power of (i)th segment
Resolution	0.01 dB

Details

p(0) is returned in dBm. Relative values (dB) to p(0) are returned for other results.

Example of Use

NBANDPVT_POWER?
> -15.31,0.83,2.24, -1.56,-0.58,0.66,....
The first level is –15.31 dBm. Subsequent level differences are 0.8, 2.24, –1.56, –0.58, and 0.66 dB.

NBANDPVT_SEG

Narrowband Power vs Time - Segment Duration and Number of Segments

Function

Sets or queries segment duration and number of segments at Narrowband Power vs Time measurement

Command

```
NBANDPVT_SEG duration,num
```

Query

```
NBANDPVT_SEG?
```

Response

duration,num

Parameters

duration	Segment duration
Range	200 to 20000 μs
Resolution	1 μs
Default	1000 μs
num	Number of segments
Range	1 to 1000
Resolution	1
Default	500

Example of Use

To set the segment duration and the number of segments measured at Narrowband Power vs Time to 2000 μs and 300, respectively:

NBANDPVT_SEG 2000,300
NBANDPVT_SEG?
> 2000,300

NBANDPVT_TIMEOUT

Narrowband Power vs Time - Trigger Timeout

Function

Sets or queries trigger timeout at Narrowband Power vs Time measurement

Command

```
NBANDPVT_TIMEOUT timeout
```

Query

```
NBANDPVT_TIMEOUT?
```

Response

timeout

Parameter

timeout	Timeout
Range	1 to 30 s
Resolution	1 s
Default	10 s

Example of Use

To set the trigger timeout to 10 s:
NBANDPVT_TIMEOUT 10
NBANDPVT_TIMEOUT?
> 10

OLVL

Output Level

Function

Sets or queries RF signal level output of MU887000A connector

Command

```
OLVL level
```

Query

```
OLVL?
```

Response

level

Unit	dBm

Parameter

level		Output level
	Range	–130.0 to –10.0 dBm (Port1/Port2)
		–120.0 to 0.0 dBm (Port3/Port4)
	Resolution	0.1 dB
	Suffix code	DBM (uses dBm when omitted)
	Default	–120.0 dBm

Details

The setting range varies with the output port setting.
When the Cable Loss Calibration is ON, the cable loss is subtracted from the output level setting range.
When the cable loss is 5 dB, the Port1/Port2 setting range is –135.0 to –15.0 dBm.

Examples of Use

To set the output level to –50.0 dBm:
OLVL-50.0

To query the currently configured output level:
OLVL?
>-50.0

Related Commands

EXTLOSSW
LOSSTBL
LOSSTBLVAL
For details of the commands, refer to Chapter 6 “Native Command Reference” in the *MU887000A TRX Test Module Operation Manual*.

REGMRXPWR

Tx/Rx vs. Frequency Measurement - Registration of Mobile Rx Power

Function

Sets or queries output RF signal level of each segment at Tx/Rx vs. Frequency measurement

Command

```
REGMRXPWR p(0)[,p(1)[,…[,p(71)]…]]
```

Query

```
REGMRXPWR?
```

Response

p(0),p(1),...,p(71)

Parameter

p(n)	RF signal output level of segment n
Range	–130.0 to –10.0 dBm (Port1/Port2)
	–120.0 to 0.0 dBm (Port3/Port4)
Resolution	0.1 dB
Suffix code	DBM (uses dBm when omitted)
Default	–120.0 dBm

Details

- Parameters in segment 1 and subsequent segments can be omitted. In this case the number of responses does not exceed the number of segments registered.
- After setting the input/output frequency in each sequence, the output level can be set using this command.
- If cable loss correction is set to ON, subtract the cable loss from the setting range of the output level.
  If the cable loss is 5 dB, use the range between –135.0 and –5.0 dB.
  In this case, if the parameter is set to 0.0 dBm, an "out of parameter setting range" error occurs. (The response to SYSERR? returns 220, "Parameter error".)
  Sending SNGLS queries whether the configured level is within the parameter setting range.

Example of Use

To set the output levels of segment 0 and segment 1 to –80 dBm and –90 dBm, respectively:
REGMRXPWR -80, -90
REGMRXPWR?
> -80.0,-90.0,-120.0,...,-120.0,-120.0*
*: Actually, 72 items are always returned even if not omitted.

5

Native Command Reference

REGMRXPWR2

Tx/Rx vs. Frequency Measurement - Registration of Mobile Rx Power

Function

Sets or queries output RF signal level of each segment at Tx/Rx vs. Frequency measurement
The command is used to set segment 36 or above.

Command

```
REGMRXPWR2 p(36)[,p(37)[,…[,p(71)]…]]
```

Query

```
REGMRXPWR2?
```

Response

p(36),p(37),...,p(71)

Parameter

p(n)	RF signal output level of segment n
Range	–130.0 to –10.0 dBm (Port1/Port2)
	–120.0 to 0.0 dBm (Port3/Port4)
Resolution	0.1 dB
Suffix code	DBM (uses dBm when omitted)
Default	–120.0 dBm

Details

- Parameters in segment 37 and subsequent segments can be omitted. In this case, the number of responses does not exceed the number of segments registered.
- After setting the output levels of segments 0 through 35 using REGMRXPWR, the output levels of segments 36 through 71 can be set using this command.
- After setting the input/output frequency in each sequence, the output level can be set using this command.
- If cable loss correction is set to ON, subtract the cable loss from the setting range of the output level.
  If the cable loss is 5 dB, use the setting range from –135.0 to –5.0 dB.
  In this case, if the parameter is set to 0.0 dBm, an "out of parameter setting range" error occurs. (The response to SYSERR? returns 220, "Parameter error").
  Sending SNGLS queries whether the configured level is within the parameter setting range.

Example of Use

With the output level of segment 0 set to –60 dBm, to set the output levels of segments up to segment 38 so that the output levels decrement by –1 MHz through each of the segments:

REGMRXPWR

-60,-61,-62,-63,-64,-65,-66,-67,-68,-69,-70,-71,-72,-73,-74,-75,-76,-77,-78,-79,-80,-81,-82,-83,-84,-85,-86,-87,-88,-89,-90,-91,-92,-93,-94,-95

REGMRXPWR?

>

-60,-61,-62,-63,-64,-65,-66,-67,-68,-69,-70,-71,-72,-73,-74,-75,-76,-77,-78,-79,-80,-81,-82,-83,-84,-85,-86,-87,-88,-89,-90,-91,-92,-93,-94,-95,…,-120.0,-120.0*

*: Actually, always returns 72 items even if not omitted.

REGMRXPWR2 -96,-97,-98

REGMRXPWR2?

> -96.0,-97.0,-98.0,…,-120.0,-120.0*

*: Actually, always returns 7 items even if not omitted.

REGMTXREF

Tx/Rx vs. Frequency Measurement - Input Level Control

Function

Sets or queries input level control at Tx/Rx vs. Frequency measurement

Command

```
REGMTXREF s[,ref(0)[,n(1),ref(1)…[,n(99),ref(99)]…]]
```

Query

```
REGMTXREF?
```

Response

s,ref(0),n(1),ref(1),n(2),ref(2),...,n(99),ref(99)

Parameters

s	Switching input level control
ON	Input level control enabled
OFF	Input level control disabled
Default	OFF
ref(i)	Step (i)th input level
Range	–65.0 to +35.0 dBm (Port1/Port2)
	–65.0 to +25.0 dBm (Port3/Port4)
Resolution	0.1 dB
n(i)	Step (i)th segment number where input level switched
Range	1 to 1598
Resolution	1
i	Number of switching input level
Range	0 to 99

Details

- ref(0) sets the input level of the header segment. Therefore, the segment number n(x) cannot be specified.
- The ref(0) and subsequent ref(i) arguments can be omitted if <s> is set to OFF. Note that n(x) and ref(x) can be set or omitted as a pair.
- The n(1) and subsequent n(i) arguments can be omitted if <s> is set to ON. Note that n(x) and ref(x) can be set or omitted as a pair.
- If the command parameters are omitted, the number of parameters in query responses must be the same as the number of parameters set using the command.

- If the cable loss correction is set to ON, the cable loss should be added to the setting range of the input level.
  If the cable loss is 5 dB, use the setting range from –60.0 to 40.0 dB.
  In this case, if the parameter is set to –65.0 dBm, an "out of parameter setting range" error occurs. (The response to SYSERR? returns 220, "Parameter error".)
  Sending SNGLS queries whether the configured level is within the parameter setting range.

Example of Use

To set the input level control to ON, the header segment input level to 24 dBm, the input levels of segment 20 and subsequent segments to 0 dBm, and the input levels of segment 30 and subsequent segments to –20 dBm:
REGMTXREF ON,24,20,0,30,-20
REGMTXREF?
> ON,24.0,20,0.0,30,-20.0

REGTX_RX_FREQ

Tx/Rx vs. Frequency Measurement - Registration of Tx/Rx Frequency

Function

Sets or queries input/output RF signal frequency of sequences 0 to 399 at Tx/Rx vs. Frequency measurement

Command

```
REGTX_RX_FREQ
dlfreq(0),ulfreq(0)[,dlfreq(1),ulfreq(1)[,…[,dlfreq(399),ulfreq(399)]…]
```

Query

```
REGTX_RX_FREQ?
```

Response

dlfreq(0),ulfreq(0),dlfreq(1),ulfreq(1), ... ,dlfreq(399),ulfreq(399)

Unit	MHz

Parameters

dlfreq(n)	Downlink frequency of sequence number n
Range	400.000000 to 6000.000000 MHz
Resolution	0.0001 MHz
Suffix code	HZ, KHZ, KZ, MHZ, MZ, GHZ, GZ (uses MHz when omitted)
Default	1000 MHz
ulfreq(n)	Uplink frequency of sequence number n
Range	400.000000 to 6000.000000 MHz
Resolution	0.0001 MHz
Suffix code	HZ, KHZ, KZ, MHZ, MZ, GHZ, GZ (uses MHz when omitted)
Default	2000 MHz

Details

- The parameter units are MHz. dlfreq(n) and ulfreq(n) are set as a pair without the units.
- The parameters for the sequence 1 and subsequent sequences can be omitted. In this case the number of responses does not exceed the number of sequences registered.

Example of Use

To set the frequency of sequences 0 and 1 to the following values:

Sequence	Output frequency	Input frequency
0	2110 MHz	1920 MHz
1	2170 MHz	1980 MHz

REGTX_RX_FREQ 2110,1920,2170,1980

REGTX_RX_FREQ?

> 2110.0000,1920.0000,2170.0000,1980.0000,…,1000.0000,2000.0000*

*: Actually, 800 items are always returned even if not omitted.

REGTX_RX_FREQ2

Tx/Rx vs. Frequency Measurement - Registration of Tx/Rx Frequency

Function

Sets or queries input/output RF signal frequency of sequences 10 through 19 at Tx/Rx vs. Frequency measurement

This command is used when setting sequence 10 or above.

Command

```
REGTX_RX_FREQ2
dlfreq(10),ulfreq(10)[,dlfreq(11),ulfreq(11)[,…[,dlfreq(19),ulfreq(19)]…]
```

Query

```
REGTX_RX_FREQ2?
```

Response

dlfreq(10),ulfreq(10),dlfreq(11),ulfreq(11), ... ,dlfreq(19),ulfreq(19)

Unit	MHz

Parameters

dlfreq(n)	Downlink frequency of sequence number n
Range	400.000000 to 6000.000000 MHz
Resolution	0.0001 MHz
Suffix code	HZ, KHZ, KZ, MHZ, MZ, GHZ, GZ (uses MHz when omitted)
Default	1000 MHz
ulfreq(n)	Uplink frequency of sequence number n
Range	400.000000 to 6000.000000 MHz
Resolution	0.0001 MHz
Suffix code	HZ, KHZ, KZ, MHZ, MZ, GHZ, GZ (uses MHz when omitted)
Default	2000 MHz

Details

- The parameter units are MHz. The dlfreq(n) and ulfreq(n) parameters are set as a pair without the units.
- The parameters for the sequence 11 and subsequent sequences can be omitted. In this case, the number of responses does not exceed the registered number of sequences.
- After setting the frequency of the sequences 0 through 9 using REGTX_RX_FREQ, the frequency of the sequences 10 through 19 can be set using this command.

Example of Use

With the output and input frequencies of sequence 0 set to 800 MHz and 900 MHz, respectively, to set both the downlink frequency and uplink frequency for sequences 1 through 19 so that both the uplink frequency and downlink frequency increment by +1 MHz through each of the sequences:

REGTX_RX_FREQ
800,900,801,901,802,902,803,903,804,904,805,905,806,906,807,907,808,908,809,909
REGTX_RX_FREQ?
>
800.0000,900.0000,801.0000,901.0000,802.0000,902.0000,803.0000,903.0000,804.0000,904.0000,805.0000,905.0000,806.0000,906.0000,807.0000,907.0000,808.0000,908.0000,809.0000,909.0000,…,1000.0000,2000.0000*

*: Actually, always returns 40 items even if not omitted.

REGTX_RX_FREQ2
810,910,811,911,812,912,813,913,814,914,815,915,816,916,817,917,818,918,819,919
REGTX_RX_FREQ2?
>
810.0000,910.0000,811.0000,911.0000,812.0000,912.0000,813.0000,913.0000,814.0000,914.0000,815.0000,915.0000,816.0000,916.0000,817.0000,917.0000,818.0000,918.0000,819.0000,919.0000

REGTX_RX_FREQ3

Tx/Rx vs. Frequency Measurement - Registration of Tx/Rx Frequency

Function

Sets or queries input/output RF signal frequency of sequences 20 to 29 at Tx/Rx vs. Frequency measurement

The command is used to set sequence 20 or above.

Command

```
REGTX_RX_FREQ3
dlfreq(20),ulfreq(20)[,dlfreq(21),ulfreq(21)[,…[,dlfreq(29),ulfreq(29)]…]
```

Query

```
REGTX_RX_FREQ3?
```

Response

dlfreq(20),ulfreq(20),dlfreq(21),ulfreq(21), ... ,dlfreq(29),ulfreq(29)

Unit	MHz

Parameter

dlfreq(n)	Downlink frequency of sequence number n
Range	400.000000 to 6000.000000 MHz
Resolution	0.0001 MHz
Suffix code	HZ, KHZ, KZ, MHZ, MZ, GHZ, GZ (uses MHz omitted)
Default	1000 MHz
ulfreq(n)	Uplink frequency of sequence number n
Range	400.000000 to 6000.000000 MHz
Resolution	0.0001 MHz
Suffix code	HZ, KHZ, KZ, MHZ, MZ, GHZ, GZ (uses MHz when omitted)
Default	2000 MHz

Details

- The parameter units are MHz. The dlfreq(n) and ulfreq(n) parameters are set as a pair without the units.
- The parameters for the sequence 21 and subsequent sequences can be omitted. In this case, the number of responses does not exceed the registered number of sequences.
- After setting the frequency of the sequences 0 through 9 using REGTX_RX_FREQ and sequences 10 through 19 using REGTX_RX_FREQ2, the frequency of the sequences 20 through 29 can be set using this command.

Example of Use

With the output and input frequencies of sequence 0 set to 800 MHz and 900 MHz, respectively, to set both downlink frequency and uplink frequency of sequences 1 through 29 so that both the uplink frequency and downlink frequency increment by +1 MHz through each of the sequences:

REGTX_RX_FREQ
800,900,801,901,802,902,803,903,804,904,805,905,806,906,807,907,808,908,809,909
REGTX_RX_FREQ?
>
800.0000,900.0000,801.0000,901.0000,802.0000,902.0000,803.0000,903.0000,804.0000,904.000
0,805.0000,905.0000,806.0000,906.0000,807.0000,907.0000,808.0000,908.0000,809.0000,909.00
00,…,1000.0000,2000.0000*
*: Actually, always returns 40 items even if not omitted.

REGTX_RX_FREQ2
810,910,811,911,812,912,813,913,814,914,815,915,816,916,817,917,818,918,819,919
REGTX_RX_FREQ2?
>
810.0000,910.0000,811.0000,911.0000,812.0000,912.0000,813.0000,913.0000,814.0000,914.000
0,815.0000,915.0000,816.0000,916.0000,817.0000,917.0000,818.0000,918.0000,819.0000,919.00
00

REGTX_RX_FREQ3
820,920,821,921,822,922,823,923,824,924,825,925,826,926,827,927,828,928,829,929
REGTX_RX_FREQ3?
>
820.0000,920.0000,821.0000,921.0000,822.0000,922.0000,823.0000,923.0000,824.0000,924.000
0,825.0000,925.0000,826.0000,926.0000,827.0000,927.0000,828.0000,928.0000,829.0000,929.00
00

REGTX_RX_FREQ4

Tx/Rx vs. Frequency Measurement - Registration of Tx/Rx Frequency

Function

Sets or queries input/output RF signal frequency of sequences 30 to 39 at Tx/Rx vs. Frequency measurement. The command is used to set sequence 30 or above.

Command

```
REGTX_RX_FREQ4
dlfreq(30),ulfreq(30)[,dlfreq(31),ulfreq(31)[,…[,dlfreq(39),ulfreq(39)]…]
```

Query

```
REGTX_RX_FREQ4?
```

Response

dlfreq(30),ulfreq(30),dlfreq(31),ulfreq(31), ... ,dlfreq(39),ulfreq(39)

Unit	MHz

Parameters

dlfreq(n)	Downlink frequency of sequence number n
Range	400.000000 to 6000.000000 MHz
Resolution	0.0001 MHz
Suffix code	HZ, KHZ, KZ, MHZ, MZ, GHZ, GZ (uses MHz when omitted)
Default	1000 MHz
ulfreq(n)	Uplink frequency of sequence number n
Range	400.000000 to 6000.000000 MHz
Resolution	0.0001 MHz
Suffix code	HZ, KHZ, KZ, MHZ, MZ, GHZ, GZ (uses MHz when omitted)
Default	2000 MHz

Details

- The parameter units are MHz. The dlfreq(n) and ulfreq(n) parameters are set as a pair without the units.
- The parameters for the sequence 31 and subsequent sequences can be omitted. In this case, the number of responses does not exceed the registered number of sequences.
- After setting the frequency of the sequences 0 through 29 using the following command, the frequency of the sequences 30 through 39 can be set using this command.
  REGTX_RX_FREQ, REGTX_RX_FREQ2, REGTX_RX_FREQ3

Example of Use

With the output and input frequencies of sequence 0 set to 800 MHz and 900 MHz, respectively, to set both downlink frequency and uplink frequency of sequences 1 through 39 so that both uplink frequency and downlink frequency increment by +1 MHz through each of the sequences:

REGTX_RX_FREQ
800,900,801,901,802,902,803,903,804,904,805,905,806,906,807,907,808,908,809,909
REGTX_RX_FREQ?
>
800.0000,900.0000,801.0000,901.0000,802.0000,902.0000,803.0000,903.0000,804.0000,904.000
0,805.0000,905.0000,806.0000,906.0000,807.0000,907.0000,808.0000,908.0000,809.0000,909.00
00,…,1000.0000,2000.0000*
*: Actually, always returns 40 items even if not omitted.

REGTX_RX_FREQ2
810,910,811,911,812,912,813,913,814,914,815,915,816,916,817,917,818,918,819,919
REGTX_RX_FREQ2?
>
810.0000,910.0000,811.0000,911.0000,812.0000,912.0000,813.0000,913.0000,814.0000,914.000
0,815.0000,915.0000,816.0000,916.0000,817.0000,917.0000,818.0000,918.0000,819.0000,919.00
00

REGTX_RX_FREQ3
820,920,821,921,822,922,823,923,824,924,825,925,826,926,827,927,828,928,829,929
REGTX_RX_FREQ3?
>
820.0000,920.0000,821.0000,921.0000,822.0000,922.0000,823.0000,923.0000,824.0000,924.000
0,825.0000,925.0000,826.0000,926.0000,827.0000,927.0000,828.0000,928.0000,829.0000,929.00
00

REGTX_RX_FREQ4
830,930,831,931,832,932,833,933,834,934,835,935,836,936,837,937,838,938,839,939
REGTX_RX_FREQ4?
>
830.0000,930.0000,831.0000,931.0000,832.0000,932.0000,833.0000,933.0000,834.0000,934.000
0,835.0000,935.0000,836.0000,936.0000,837.0000,937.0000,838.0000,938.0000,839.0000,939.00
00

REGTX_RX_FREQ5

Tx/Rx vs. Frequency Measurement - Registration of Tx/Rx Frequency

Function

Sets or queries input/output RF signal frequency of sequences 40 to 49 at Tx/Rx vs. Frequency measurement. The command is used to set sequence 40 or above.

Command

```
REGTX_RX_FREQ5
dlfreq(40),ulfreq(40)[,dlfreq(41),ulfreq(41)[,…[,dlfreq(49),ulfreq(49)]…]
```

Query

```
REGTX_RX_FREQ5?
```

Response

dlfreq(40),ulfreq(40),dlfreq(41),ulfreq(41), ... ,dlfreq(49),ulfreq(49)

Unit	MHz

Parameters

dlfreq(n)	Downlink frequency of sequence number n
Range	400.000000 to 6000.000000 MHz
Resolution	0.0001 MHz
Suffix code	HZ, KHZ, KZ, MHZ, MZ, GHZ, GZ (uses MHz when omitted)
Default	1000 MHz
ulfreq(n)	Uplink frequency of sequence number n
Range	400.000000 to 6000.000000 MHz
Resolution	0.0001 MHz
Suffix code	HZ, KHZ, KZ, MHZ, MZ, GHZ, GZ (uses MHz when omitted)
Default	2000 MHz

Details

- The parameter units are MHz. The dlfreq(n) and ulfreq(n) parameters are set as a pair without the units.
- The parameters for the sequence 41 and subsequent sequences can be omitted. In this case, the number of responses does not exceed the registered number of sequences.
- After setting the frequency of the sequences 0 through 39 using the following command, the frequency of the sequences 40 through 49 can be set using this command.
  REGTX_RX_FREQ, REGTX_RX_FREQ2, REGTX_RX_FREQ3, REGTX_RX_FREQ4

Example of Use

With the output and input frequencies of sequence 0 set to 800 MHz and 900 MHz, respectively, to set both downlink frequency and uplink frequency of sequences 1 through 49 so that both uplink frequency and downlink frequency increment by +1 MHz through each of the sequences:

REGTX_RX_FREQ
800,900,801,901,802,902,803,903,804,904,805,905,806,906,807,907,808,908,809,909
REGTX_RX_FREQ?
>
800.0000,900.0000,801.0000,901.0000,802.0000,902.0000,803.0000,903.0000,804.0000,904.000
0,805.0000,905.0000,806.0000,906.0000,807.0000,907.0000,808.0000,908.0000,809.0000,909.00
00,…,1000.0000,2000.0000*
*: Actually, always returns 40 items even if not omitted.

REGTX_RX_FREQ2
810,910,811,911,812,912,813,913,814,914,815,915,816,916,817,917,818,918,819,919
REGTX_RX_FREQ2?
>
810.0000,910.0000,811.0000,911.0000,812.0000,912.0000,813.0000,913.0000,814.0000,914.000
0,815.0000,915.0000,816.0000,916.0000,817.0000,917.0000,818.0000,918.0000,819.0000,919.00
00

REGTX_RX_FREQ3
820,920,821,921,822,922,823,923,824,924,825,925,826,926,827,927,828,928,829,929
REGTX_RX_FREQ3?
>
820.0000,920.0000,821.0000,921.0000,822.0000,922.0000,823.0000,923.0000,824.0000,924.000
0,825.0000,925.0000,826.0000,926.0000,827.0000,927.0000,828.0000,928.0000,829.0000,929.00
00

…

REGTX_RX_FREQ5
840,940,841,941,842,942,843,943,844,944,845,945,846,946,847,947,848,948,849,949
REGTX_RX_FREQ5?
>
840.0000,940.0000,841.0000,941.0000,842.0000,942.0000,843.0000,943.0000,844.0000,944.000
0,845.0000,945.0000,846.0000,946.0000,847.0000,947.0000,848.0000,948.0000,849.0000,949.00
00

REGTX_RX_FREQ6

Tx/Rx vs. Frequency Measurement - Registration of Tx/Rx Frequency

Function

Sets or queries input/output RF signal frequency of sequences 50 to 59 at Tx/Rx vs. Frequency measurement. The command is used to set sequence 50 or above.

Command

```
REGTX_RX_FREQ6
dlfreq(50),ulfreq(50)[,dlfreq(51),ulfreq(51)[,…[,dlfreq(59),ulfreq(59)]…]
```

Query

```
REGTX_RX_FREQ6?
```

Response

dlfreq(50),ulfreq(50),dlfreq(51),ulfreq(51), ... ,dlfreq(59),ulfreq(59)

Unit	MHz

Parameters

dlfreq(n)	Downlink frequency of sequence number n
Range	400.000000 to 6000.000000 MHz
Resolution	0.0001 MHz
Suffix code	HZ, KHZ, KZ, MHZ, MZ, GHZ, GZ (uses MHz when omitted)
Default	1000 MHz
ulfreq(n)	Uplink frequency of sequence number n
Range	400.000000 to 6000.000000 MHz
Resolution	0.0001 MHz
Suffix code	HZ, KHZ, KZ, MHZ, MZ, GHZ, GZ (uses MHz when omitted)
Default	2000 MHz

Details

- The parameter units are MHz. The dlfreq(n) and ulfreq(n) parameters are set as a pair without the units.
- The parameters for the sequence 51 and subsequent sequences can be omitted. In this case, the number of responses does not exceed the registered number of sequences.
- After setting the frequency of the sequences 0 through 49 using the following command, the frequency of the sequences 50 through 59 can be set using this command.
  REGTX_RX_FREQ, REGTX_RX_FREQ2, REGTX_RX_FREQ3, …, REGTX_RX_FREQ5

Example of Use

With the output and input frequencies of sequence 0 set to 800 MHz and 900 MHz, respectively, to set both downlink frequency and uplink frequency of sequences 1 through 59 so that both uplink frequency and downlink frequency increment by +1 MHz through each of the sequences:

REGTX_RX_FREQ
800,900,801,901,802,902,803,903,804,904,805,905,806,906,807,907,808,908,809,909
REGTX_RX_FREQ?
>
800.0000,900.0000,801.0000,901.0000,802.0000,902.0000,803.0000,903.0000,804.0000,904.000
0,805.0000,905.0000,806.0000,906.0000,807.0000,907.0000,808.0000,908.0000,809.0000,909.00
00,…,1000.0000,2000.0000*

*: Actually, always returns 40 items even if not omitted.

REGTX_RX_FREQ2
810,910,811,911,812,912,813,913,814,914,815,915,816,916,817,917,818,918,819,919
REGTX_RX_FREQ2?
>
810.0000,910.0000,811.0000,911.0000,812.0000,912.0000,813.0000,913.0000,814.0000,914.000
0,815.0000,915.0000,816.0000,916.0000,817.0000,917.0000,818.0000,918.0000,819.0000,919.00
00

REGTX_RX_FREQ3
820,920,821,921,822,922,823,923,824,924,825,925,826,926,827,927,828,928,829,929
REGTX_RX_FREQ3?
>
820.0000,920.0000,821.0000,921.0000,822.0000,922.0000,823.0000,923.0000,824.0000,924.000
0,825.0000,925.0000,826.0000,926.0000,827.0000,927.0000,828.0000,928.0000,829.0000,929.00
00

…

REGTX_RX_FREQ6
850,950,851,951,852,952,853,953,854,954,855,955,856,956,857,957,858,958,859,959
REGTX_RX_FREQ6?
>
850.0000,950.0000,851.0000,951.0000,852.0000,952.0000,853.0000,953.0000,854.0000,954.000
0,855.0000,955.0000,856.0000,956.0000,857.0000,957.0000,858.0000,958.0000,859.0000,959.00
00

REGTX_RX_FREQ7

Tx/Rx vs. Frequency Measurement - Registration of Tx/Rx Frequency

Function

Sets or queries input/output RF signal frequency of sequences 60 to 69 at Tx/Rx vs. Frequency measurement. The command is used to set sequence 60 or above.

Command

```
REGTX_RX_FREQ7
dlfreq(60),ulfreq(60)[,dlfreq(61),ulfreq(61)[,…[,dlfreq(69),ulfreq(69)]…]
```

Query

```
REGTX_RX_FREQ7?
```

Response

dlfreq(60),ulfreq(60),dlfreq(61),ulfreq(61), ... ,dlfreq(69),ulfreq(69)

Unit	MHz

Parameters

dlfreq(n)	Downlink frequency of sequence number n
Range	400.000000 to 6000.000000 MHz
Resolution	0.0001 MHz
Suffix code	HZ, KHZ, KZ, MHZ, MZ, GHZ, GZ (uses MHz when omitted)
Default	1000 MHz
ulfreq(n)	Uplink frequency of sequence number n
Range	400.000000 to 6000.000000 MHz
Resolution	0.0001 MHz
Suffix code	HZ, KHZ, KZ, MHZ, MZ, GHZ, GZ (uses MHz when omitted)
Default	2000 MHz

Details

- The parameter units are MHz. The dlfreq(n) and ulfreq(n) parameters are set as a pair without the units.
- The parameters for the sequence 61 and subsequent sequences can be omitted. In this case, the number of responses does not exceed the registered number of sequences.
- After setting the frequency of the sequences 0 through 59 using the following command, the frequency of the sequences 60 through 69 can be set using this command.
  REGTX_RX_FREQ, REGTX_RX_FREQ2, REGTX_RX_FREQ3, …, REGTX_RX_FREQ6

Example of Use

With the output and input frequencies of sequence 0 set to 800 MHz and 900 MHz, respectively, to set both downlink frequency and uplink frequency of sequences 1 through 69 so that both uplink frequency and downlink frequency increment by +1 MHz through each of the sequences:

REGTX_RX_FREQ
800,900,801,901,802,902,803,903,804,904,805,905,806,906,807,907,808,908,809,909
REGTX_RX_FREQ?
>
800.0000,900.0000,801.0000,901.0000,802.0000,902.0000,803.0000,903.0000,804.0000,904.0000,805.0000,905.0000,806.0000,906.0000,807.0000,907.0000,808.0000,908.0000,809.0000,909.0000,…,1000.0000,2000.0000*

*: Actually, always returns 40 items even if not omitted.

REGTX_RX_FREQ2
810,910,811,911,812,912,813,913,814,914,815,915,816,916,817,917,818,918,819,919
REGTX_RX_FREQ2?
>
810.0000,910.0000,811.0000,911.0000,812.0000,912.0000,813.0000,913.0000,814.0000,914.0000,815.0000,915.0000,816.0000,916.0000,817.0000,917.0000,818.0000,918.0000,819.0000,919.0000

REGTX_RX_FREQ3
820,920,821,921,822,922,823,923,824,924,825,925,826,926,827,927,828,928,829,929
REGTX_RX_FREQ3?
>
820.0000,920.0000,821.0000,921.0000,822.0000,922.0000,823.0000,923.0000,824.0000,924.0000,825.0000,925.0000,826.0000,926.0000,827.0000,927.0000,828.0000,928.0000,829.0000,929.0000

…

REGTX_RX_FREQ7
860,960,861,961,862,962,863,963,864,964,865,965,866,966,867,967,868,968,869,969
REGTX_RX_FREQ7?
>
860.0000,960.0000,861.0000,961.0000,862.0000,962.0000,863.0000,963.0000,864.0000,964.0000,865.0000,965.0000,866.0000,966.0000,867.0000,967.0000,868.0000,968.0000,869.0000,969.0000

REGTX_RX_FREQ8

Tx/Rx vs. Frequency Measurement - Registration of Tx/Rx Frequency

Function

Sets or queries input/output RF signal frequency of sequences 70 to 79 at Tx/Rx vs. Frequency measurement. The command is used to set sequence 70 or above.

Command

```
REGTX_RX_FREQ8
dlfreq(70),ulfreq(70)[,dlfreq(71),ulfreq(71)[,…[,dlfreq(79),ulfreq(79)]…]
```

Query

```
REGTX_RX_FREQ8?
```

Response

dlfreq(70),ulfreq(70),dlfreq(71),ulfreq(71), ... ,dlfreq(79),ulfreq(79)

Unit	MHz

Parameters

dlfreq(n)	Downlink frequency of sequence number n
Range	400.000000 to 6000.000000 MHz
Resolution	0.0001 MHz
Suffix code	HZ, KHZ, KZ, MHZ, MZ, GHZ, GZ (uses MHz when omitted)
Default	1000 MHz
ulfreq(n)	Uplink frequency of sequence number n
Range	400.000000 to 6000.000000 MHz
Resolution	0.0001 MHz
Suffix code	HZ, KHZ, KZ, MHZ, MZ, GHZ, GZ (uses MHz when omitted)
Default	2000 MHz

Details

- The parameter units are MHz. The dlfreq(n) and ulfreq(n) parameters are set as a pair without the units.
- The parameters for the sequence 71 and subsequent sequences can be omitted. In this case, the number of responses does not exceed the registered number of sequences.
- After setting the frequency of the sequences 0 through 69 using the following command, the frequency of the sequences 70 through 79 can be set using this command.
  REGTX_RX_FREQ, REGTX_RX_FREQ2, REGTX_RX_FREQ3, …, REGTX_RX_FREQ7

Example of Use

With the output and input frequencies of sequence 0 set to 800 MHz and 900 MHz, respectively, to set both downlink frequency and uplink frequency of sequences 1 through 79 so that both uplink frequency and downlink frequency increment by +1 MHz through each of the sequences:

REGTX_RX_FREQ
800,900,801,901,802,902,803,903,804,904,805,905,806,906,807,907,808,908,809,909
REGTX_RX_FREQ?
>
800.0000,900.0000,801.0000,901.0000,802.0000,902.0000,803.0000,903.0000,804.0000,904.0000,805.0000,905.0000,806.0000,906.0000,807.0000,907.0000,808.0000,908.0000,809.0000,909.0000,…,1000.0000,2000.0000*

*: Actually, always returns 40 items even if not omitted.

REGTX_RX_FREQ2
810,910,811,911,812,912,813,913,814,914,815,915,816,916,817,917,818,918,819,919
REGTX_RX_FREQ2?
>
810.0000,910.0000,811.0000,911.0000,812.0000,912.0000,813.0000,913.0000,814.0000,914.0000,815.0000,915.0000,816.0000,916.0000,817.0000,917.0000,818.0000,918.0000,819.0000,919.0000

REGTX_RX_FREQ3
820,920,821,921,822,922,823,923,824,924,825,925,826,926,827,927,828,928,829,929
REGTX_RX_FREQ3?
>
820.0000,920.0000,821.0000,921.0000,822.0000,922.0000,823.0000,923.0000,824.0000,924.0000,825.0000,925.0000,826.0000,926.0000,827.0000,927.0000,828.0000,928.0000,829.0000,929.0000

…

REGTX_RX_FREQ8
870,970,871,971,872,972,873,973,874,974,875,975,876,976,877,977,878,978,879,979
REGTX_RX_FREQ8?
>
870.0000,970.0000,871.0000,971.0000,872.0000,972.0000,873.0000,973.0000,874.0000,974.0000,875.0000,975.0000,876.0000,976.0000,877.0000,977.0000,878.0000,978.0000,879.0000,979.0000

REGTX_RX_FREQ9

Tx/Rx vs. Frequency Measurement - Registration of Tx/Rx Frequency

Function

Sets or queries input/output RF signal frequency of sequences 80 to 89 at Tx/Rx vs. Frequency measurement. The command is used to set sequence 80 or above.

Command

```
REGTX_RX_FREQ9
dlfreq(80),ulfreq(80)[,dlfreq(81),ulfreq(81)[,…[,dlfreq(89),ulfreq(89)]…]
```

Query

```
REGTX_RX_FREQ9?
```

Response

dlfreq(80),ulfreq(80),dlfreq(81),ulfreq(81), ... ,dlfreq(89),ulfreq(89)

Unit	MHz

Parameters

dlfreq(n)	Downlink frequency of sequence number n
Range	400.000000 to 6000.000000 MHz
Resolution	0.0001 MHz
Suffix code	HZ, KHZ, KZ, MHZ, MZ, GHZ, GZ (uses MHz when omitted)
Default	1000 MHz
ulfreq(n)	Uplink frequency of sequence number n
Range	400.000000 to 6000.000000 MHz
Resolution	0.0001 MHz
Suffix code	HZ, KHZ, KZ, MHZ, MZ, GHZ, GZ (uses MHz when omitted)
Default	2000 MHz

Details

- The parameter units are MHz. The dlfreq(n) and ulfreq(n) parameters are set as a pair without the units.
- The parameters for the sequence 81 and subsequent sequences can be omitted. In this case, the number of responses does not exceed the registered number of sequences.
- After setting the frequency of the sequences 0 through 79 using the following command, the frequency of the sequences 80 through 89 can be set using this command.
  REGTX_RX_FREQ, REGTX_RX_FREQ2, REGTX_RX_FREQ3, …, REGTX_RX_FREQ8

Example of Use

With the output and input frequencies of sequence 0 set to 800 MHz and 900 MHz, respectively, to set both downlink frequency and uplink frequency of sequences 1 through 89 so that both uplink frequency and downlink frequency increment by +1 MHz through each of the sequences:

REGTX_RX_FREQ
800,900,801,901,802,902,803,903,804,904,805,905,806,906,807,907,808,908,809,909
REGTX_RX_FREQ?
>
800.0000,900.0000,801.0000,901.0000,802.0000,902.0000,803.0000,903.0000,804.0000,904.0000,805.0000,905.0000,806.0000,906.0000,807.0000,907.0000,808.0000,908.0000,809.0000,909.0000,…,1000.0000,2000.0000*
*: Actually, always returns 40 items even if not omitted.

REGTX_RX_FREQ2
810,910,811,911,812,912,813,913,814,914,815,915,816,916,817,917,818,918,819,919
REGTX_RX_FREQ2?
>
810.0000,910.0000,811.0000,911.0000,812.0000,912.0000,813.0000,913.0000,814.0000,914.0000,815.0000,915.0000,816.0000,916.0000,817.0000,917.0000,818.0000,918.0000,819.0000,919.0000

REGTX_RX_FREQ3
820,920,821,921,822,922,823,923,824,924,825,925,826,926,827,927,828,928,829,929
REGTX_RX_FREQ3?
>
820.0000,920.0000,821.0000,921.0000,822.0000,922.0000,823.0000,923.0000,824.0000,924.0000,825.0000,925.0000,826.0000,926.0000,827.0000,927.0000,828.0000,928.0000,829.0000,929.0000

…

REGTX_RX_FREQ9
880,980,881,981,882,982,883,983,884,984,885,985,886,986,887,987,888,988,889,989
REGTX_RX_FREQ9?
>
880.0000,980.0000,881.0000,981.0000,882.0000,982.0000,883.0000,983.0000,884.0000,984.0000,885.0000,985.0000,886.0000,986.0000,887.0000,987.0000,888.0000,988.0000,889.0000,989.0000

REGTX_RX_FREQ10

Tx/Rx vs. Frequency Measurement - Registration of Tx/Rx Frequency

Function

Sets or queries input/output RF signal frequency of sequences 90 to 99 at Tx/Rx vs. Frequency measurement. The command is used to set sequence 90 or above.

Command

```
REGTX_RX_FREQ10
dlfreq(90),ulfreq(90)[,dlfreq(91),ulfreq(91)[,…[,dlfreq(99),ulfreq(99)]…]
```

Query

```
REGTX_RX_FREQ10?
```

Response

dlfreq(90),ulfreq(90),dlfreq(91),ulfreq(91), ... ,dlfreq(99),ulfreq(99)

Unit	MHz

Parameters

dlfreq(n)	Downlink frequency of sequence number n
Range	400.000000 to 6000.000000 MHz
Resolution	0.0001 MHz
Suffix code	HZ, KHZ, KZ, MHZ, MZ, GHZ, GZ
Default	1000 MHz
ulfreq(n)	Uplink frequency of sequence number n
Range	400.000000 to 6000.000000 MHz
Resolution	0.0001 MHz
Suffix code	HZ, KHZ, KZ, MHZ, MZ, GHZ, GZ
Default	2000 MHz

Details

- The parameter units are MHz. The dlfreq(n) and ulfreq(n) parameters are set as a pair without the units.
- The parameters for the sequence 91 and subsequent sequences can be omitted. In this case, the number of responses does not exceed the registered number of sequences.
- After setting the frequency of the sequences 0 through 89 using the following command, the frequency of the sequences 90 through 99 can be set using this command.
  REGTX_RX_FREQ, REGTX_RX_FREQ2, REGTX_RX_FREQ3, ..., REGTX_RX_FREQ9

Example of Use

With the output and input frequencies of sequence 0 set to 800 MHz and 900 MHz, respectively, to set both downlink frequency and uplink frequency of sequences 1 through 99 so that both uplink frequency and downlink frequency increment by +1 MHz through each of the sequences:

REGTX_RX_FREQ
800,900,801,901,802,902,803,903,804,904,805,905,806,906,807,907,808,908,809,909
REGTX_RX_FREQ?
>
800.0000,900.0000,801.0000,901.0000,802.0000,902.0000,803.0000,903.0000,804.0000,904.0000,805.0000,905.0000,806.0000,906.0000,807.0000,907.0000,808.0000,908.0000,809.0000,909.0000,…,1000.0000,2000.0000*
*: Actually, always returns 40 items even if not omitted.

REGTX_RX_FREQ2
810,910,811,911,812,912,813,913,814,914,815,915,816,916,817,917,818,918,819,919
REGTX_RX_FREQ2?
>
810.0000,910.0000,811.0000,911.0000,812.0000,912.0000,813.0000,913.0000,814.0000,914.0000,815.0000,915.0000,816.0000,916.0000,817.0000,917.0000,818.0000,918.0000,819.0000,919.0000

REGTX_RX_FREQ3
820,920,821,921,822,922,823,923,824,924,825,925,826,926,827,927,828,928,829,929
REGTX_RX_FREQ3?
>
820.0000,920.0000,821.0000,921.0000,822.0000,922.0000,823.0000,923.0000,824.0000,924.0000,825.0000,925.0000,826.0000,926.0000,827.0000,927.0000,828.0000,928.0000,829.0000,929.0000

…

REGTX_RX_FREQ10
890,990,891,991,892,992,893,993,894,994,895,995,896,996,897,997,898,998,899,999
REGTX_RX_FREQ10?
>
890.0000,990.0000,891.0000,991.0000,892.0000,992.0000,893.0000,993.0000,894.0000,994.0000,895.0000,995.0000,896.0000,996.0000,897.0000,997.0000,898.0000,998.0000,899.0000,999.0000

REGTX_RX_FREQ11 to REGTX_RX_FREQ40

Tx/Rx vs. Frequency Measurement - Registration of Tx/Rx Frequency

Function

Sets or queries the input/output RF signal frequencies of the sequences 100 through 109, 110 through 119, …, and 390 through 399 at the Tx/Rx vs. Frequency measurement. The command is used to set the sequence 100 or above.

Command

```
REGTX_RX_FREQ11
dlfreq(100),ulfreq(100)[,dlfreq(101),ulfreq(101)[,…[,dlfreq(109),ulfreq(1
09)]…]

REGTX_RX_FREQ12
dlfreq(110),ulfreq(110)[,dlfreq(111),ulfreq(111)[,…[,dlfreq(119),ulfreq(1
19)]…]

…

REGTX_RX_FREQ40
dlfreq(390),ulfreq(390)[,dlfreq(391),ulfreq(391)[,…[,dlfreq(399),ulfreq(3
99)]…]
```

Query

```
REGTX_RX_FREQ11?
REGTX_RX_FREQ12?
…
REGTX_RX_FREQ40?
```

Response

dlfreq(110),ulfreq(110),dlfreq(111),ulfreq(111), … ,dlfreq(119),ulfreq(119)
dlfreq(120),ulfreq(120),dlfreq(121),ulfreq(121), … ,dlfreq(129),ulfreq(129)
…
dlfreq(390),ulfreq(390),dlfreq(391),ulfreq(391), … ,dlfreq(399),ulfreq(399)

Unit	MHz

Parameter

dlfreq(n)	Downlink frequency of sequence number n
Range	400.000000 to 6000.000000 MHz
Resolutin	0.0001 MHz
Suffix code	HZ, KHZ, KZ, MHZ, MZ, GHZ, GZ

	MHz when omitted
Default	1000 MHz
ulfreq(n)	Uplink frequency of sequence number n
Range	400.000000 to 6000.000000 MHz
Resolutin	0.0001 MHz
Suffix code	HZ, KHZ, KZ, MHZ, MZ, GHZ, GZ
	MHz when omitted
Default	2000 MHz

Details

- The parameter units are MHz. The dlfreq(n) and ulfreq(n) parameters are set as a pair without the units.
- The parameters for the sequence 101, 111, ... , and 391 and subsequent sequences can be omitted. In this case, the number of responses does not exceed the registered number of sequences.
- After setting the frequency of the sequences 0 through 99, 109,…,389 using the following command, the frequency of the sequences 100 through 109, 110 through 119,…,390 through 399 can be set using this command.
  REGTX_RX_FREQ,REGTX_RX_FREQ2,REGTX_RX_FREQ3, to
  REGTX_RX_FREQ10 ,REGTX_RX_FREQ11,…, REGTX_RX_FREQ39

RXFREQ

Downlink Frequency

Function

Sets or queries downlink frequency of mobile station

Command

`RXFREQ dl_freq`

Query

`RXFREQ?`

Response

dl_freq

Parameter

dl_freq	Downlink frequency
Range	400.000000 to 6000.000000 MHz
Resolution	1 Hz
Suffix code	HZ, KHZ, KZ, MHZ, MZ, GHZ, GZ (uses Hz when omitted)
Default	2140.000000 MHz

Examples of Use

To set the downlink frequency to 2120 MHz:
RXFREQ 2120MHZ

To query the currently configured downlink frequency:
RXFREQ?
>2120000000

SPMDETECT

Spectrum Monitor - Detect Mode

Function

Sets or queries detection mode at spectrum monitor measurement

Command

```
SPMDETECT mode
```

Query

```
SPMDETECT?
```

Response

mode

Parameter

mode	Detection mode
PEAK	Peak detection
RMS	RMS detection
Default	PEAK

Example of Use

To set the detection mode to RMS:

SPMDETECT RMS

SPMDETECT?

> RMS

SPMPMBW

Spectrum Monitor - Power Measurement Bandwidth

Function

Sets or queries power measurement bandwidth at spectrum monitor measurement

Command

```
SPMPMBW width
```

Query

```
SPMPMBW?
```

Response

width

Unit	MHz

Parameter

width	Bandwidth (varies depending on the frequency span)	
Range	0.001 to 1.000 MHz	(when frequency span is 1 MHz)
	0.001 to 2.500 MHz	(when frequency span is 2.5 MHz)
	0.001 to 5.000 MHz	(when frequency span is 5 MHz)
	0.001 to 10.000 MHz	(when frequency span is 10 MHz)
	0.001 to 25.000 MHz	(when frequency span is 25 MHz)
	0.001 to 50.000 MHz	(when frequency span is 50 MHz)
	0.001 to 100.000 MHz	(when frequency span is 100 MHz)
	0.001 to 160.000 MHz	(when frequency span is 160 MHz)
Resolution	0.001 MHz	
Suffix code	HZ, KHZ, KZ, MHZ, MZ, GHZ, GZ (uses MHz when omitted)	
Default	1.000 MHz	(when frequency span is 1 MHz)
	2.500 MHz	(when frequency span is 2.5 MHz)
	5.000 MHz	(when frequency span is 5 MHz)
	10.000 MHz	(when frequency span is 10 MHz)
	25.000 MHz	(when frequency span is 25 MHz)
	50.000 MHz	(when frequency span is 50 MHz)
	100.000 MHz	(when frequency span is 100 MHz)
	160.000 MHz	(when frequency span is 160 MHz)

Details

The power measurement bandwidth is set to the span value or less.

Examples of Use

To set the frequency span to 5 MHz:
SPMSPAN 5MHZ
SPMSPAN?
> 5MHZ

To set the power measurement bandwidth to 2.5 MHz:
SPMPMBW 2.5MHZ
SPMPMBW?
> 2.5MHZ

SPMPWR?

Spectrum Monitor - Power

Function

Queries total power of spectrum monitor measurements

Query

```
SPMPWR?
```

Response

power

Unit	dBm

Parameter

power	Power conversion value
Resolution	0.01 dB

Example of Use

To query the total power of spectrum monitor measurements:
SPMPWR?
>-10.01

Related Command

SPMSTORAGECOUNT

SPMRBW

Spectrum Monitor - Resolution Bandwidth

Function

Sets or queries resolution bandwidth (RBW) at spectrum monitor measurement

Command

```
SPMRBW bandwidth
```

Query

```
SPMRBW?
```

Response

bandwidth

Parameter

bandwidth	RBW
100HZ	100 Hz
300HZ	300 Hz
1KHZ	1 kHz
3KHZ	3 kHz
10KHZ	10 kHz
30KHZ	30 kHz
100KHZ	100 kHz
300KHZ	300 kHz
1MHZ	1 MHz
Default	100 KHZ

Example of Use

To set the RBW to 3 kHz:

SPMRBW 3KHZ

SPMRBW?

> 3KHZ

Remarks

The RBW setting range is limited by the frequency span setting.

For the relationship between span and resolution, refer to Table 2.2.1-1 “Span and Resolution Setting Range and Number of Data Points”.

SPMSPAN

Spectrum Monitor - Span

Function

Sets or queries frequency span at spectrum monitor measurement

Command

```
SPMSPAN span
```

Query

```
SPMSPAN?
```

Response

span

Parameter

span	Frequency span
1MHZ	1 MHz
2.5MHZ	2.5 MHz
5MHZ	5 MHz
10MHZ	10 MHz
25MHZ	25 MHz
50MHZ	50 MHz
100MHZ	100 MHz
160MHZ	160 MHz
Default	25 MHZ

Example of Use

To set the frequency span to 5 MHz:

SPMSPAN 5MHZ

SPMSPAN?

> 5MHZ

Remarks

For the relationship between span and resolution, refer to Table 2.2.1-1 "Span and Resolution Setting Range and Number of Data Points".

SPMSTORAGECOUNT

Spectrum Monitor - Storage Count

Function

Sets or queries number of data acquisitions at spectrum monitor measurement

Command

`SPMSTORAGECOUNT count`

Query

`SPMSTORAGECOUNT?`

Response

count

Parameter

count	Number of data acquisitions
Range	2 to 100
Resolution	1
Default	10

Example of Use

To set the number of data acquisitions to 100:

SPMSTORAGECOUNT 100

SPMSTORAGECOUNT?

> 100

SPMSTORAGEMODE

Spectrum Monitor - Storage Mode

Function

Sets or queries method for saving spectrum monitor measurements

Command

`SPMSTORAGEMODE mode`

Query

`SPMSTORAGEMODE?`

Response

mode

Parameter

mode	Method for saving measurement results
OFF	Latest measurement result
AVG	Average value calculated from total measurements
MAX	Maximum result out of multiple measurements
MIN	Minimum result out of multiple measurements
Default	OFF

Example of Use

To set the method for saving the measurement results to save the maximum result of multiple measurements:

SPMSTORAGEMODE MAX
SPMSTORAGEMODE?
> MAX

Related Command

SPMSTORAGECOUNT

SPMTIME

Spectrum Monitor - Analysis Time

Function

Sets or queries analysis time at spectrum monitor measurement

Command

```
SPMTIME anlylen
```

Query

```
SPMTIME?
```

Response

anlylen

Parameter

anlylen	Analysis time
1MS	1 ms
10MS	10 ms
Default	1MS

Example of Use

To set the analysis time to 10 ms:

SPMTIME 10MS
SPMTIME?
> 10MS

SPMTIMEOUT

Spectrum Monitor - Trigger Timeout

Function

Sets or queries trigger timeout

Command

`SPMTIMEOUT time`

Query

`SPMTIMEOUT?`

Response

`time`

Unit	s

Parameter

time	Timeout
Range	1 to 60 s
Resolution	1 s
Suffix code	NS, US, MS, S (uses s when omitted)
Default	10 s

Example of Use

To set the trigger timeout to 5 s:

SPMTIMEOUT 5

SPMTIMEOUT?

> 5

SPMTGDELAY

Spectrum Monitor - Trigger Delay

Function

Sets or queries trigger delay time

Command

`SPMTGDELAY time`

Query

`SPMTGDELAY`

Response

time

Unit	ms

Parameter

time	Trigger delay time
Range	–9.99 to 9.99 ms
Resolution	0.01 ms
Suffix code	NS, US, MS, S (uses ms when omitted)
Default	0.00 ms

Example of Use

To set the trigger delay time to –1.23 ms:

SPMTGDELAY -1.23

SPMTGDELAY?

> -1.23

SPMTGSRC

Spectrum Monitor - Trigger Source

Function

Sets or queries measurement start trigger at spectrum monitor measurement

Command

```
SPMTGSRC source
```

Query

```
SPMTGSRC
```

Response

source

Parameter

source	Trigger source
FREERUN	No trigger
PWR	Signal level
Default	FREERUN

Example of Use

To set the parameter to no trigger:

SPMTGSRC FREERUN

SPMTGSRC?

> FREERUN

SPMWAVEPOINT?

Spectrum Monitor - Trace Point

Function

Queries number of points of spectrum monitor measurement data.

Query

```
SPMWAVEPOINT
```

Response

point

Parameter

point	Number of points
Range	513, 641, 821, 1025, 1281, 1641, 2049, 2561, 4097, 6555, 8193, 10241, 16385, 26217

Example of Use

To query the number of points of spectrum monitor measurement data:
SPMWAVEPOINT?
>4097

Remarks

For the relationship between the measurement conditions and the number of data points, refer to Table 2.2.1-1 “Span and Resolution Setting Range and Number of Data Points”.

TXFREQ

Uplink Frequency

Function

Sets or queries the TX frequency (uplink frequency) of mobile station.

Command

```
TXFREQ ul_freq
```

Query

```
TXFREQ?
```

Response

ul_freq

Parameter

ul_freq	Uplink frequency
Range	400.000000 to 6000.000000 MHz
Resolution	1 Hz
Suffix code	HZ, KHZ, KZ, MHZ, MZ, GHZ, GZ (uses Hz when omitted)
Default	1950.000000 MHz

Examples of Use

To set the uplink frequency to 1950 MHz:
TXFREQ 1950MHZ

To query the uplink frequency:
TXFREQ?
>1950000000

TX_RX_FLT

Tx/Rx vs. Frequency Measurement - Filter

Function

Sets or queries filters at Tx/Rx vs. Frequency measurement.

Command

```
TX_RX_FLT filter
```

Query

```
TX_RX_FLT?
```

Response

filter

Parameter

filter	Filter
RRC	RRC 3.84 MHz filter
BW1.4MHZ	BW 1.4 MHz filter
BW3MHZ	BW 3 MHz filter
BW5MHZ	BW 5 MHz filter
BW10MHZ	BW 10 MHz filter
BW15MHZ	BW 15 MHz filter
BW20MHZ	BW 20 MHz filter
CDMA2K	CDMA2K 1.2288 MHz filter
Default	BW5MHZ

Example of Use

To set the filter bandwidth to 5 MHz:

TX_RX_FLT BW5MHz

TX_RX_FLT?

> BW5MHZ

TX_RX_FREQ?

Tx/Rx vs. Frequency Measurement - Level

Function

Queries average power of each segment according to Tx/Rx vs. Frequency measurement results

Query

TX_RX_FREQ?

Response

l(1),l(2),...,l(n)
(n = (number of segments – 1) × number of sequences)

Unit	dBm

Parameter

l(n)	(n)th average power
Resolution	0.01 dB
Suffix code	None

Example of Use

To query the measurement results at Tx/Rx vs. Frequency measurement:
TX_RX_FREQ?
> -10.00,999.99,-8.88,…,-10.00

Remarks

If the TX_RX_INV_RSLT_OUT is set to OFF, an invalid measurement result is returned in as 999.99.
If the measurement result of the segment is level over, the response is 999.99.

TX_RX_FREQ_NUM?

Tx/Rx vs. Frequency Measurement - Valid Number of Sequences and Segments

Function

Queries number of valid measurement results at Tx/Rx vs. Frequency measurement

Query

```
TX_RX_FREQ_NUM?
```

Response

n,seg,seq

Parameters

n	Number of measurement results = (number of segments – 1) × number of sequences
Range	1 to 6396
Resolution	1
seg	Number of segments – 1
Range	1 to 1599
Resolution	1
seq	Number of sequences
Range	1 to 400
Resolution	1

Example of Use

To query the number of valid measurement results at Tx/Rx vs. Frequency measurement:

TX_RX_FREQ_NUM?

> 56,14,4

TX_RX_INV_RSLT_OUT

Tx/Rx vs. Frequency Measurement - Invalid Result Output

Function

Sets whether measurement results of invalid measurement intervals at Tx/Rx vs. Frequency measurement output as invalid value or numeric value

Command

```
TX_RX_INV_RSLT_OUT on_off
```

Query

```
TX_RX_INV_RSLT_OUT?
```

Response

on_off

Parameter

on_off	Display method for invalid measurement results
ON	Display numeric values
OFF	Display invalid value (999.99)
Default	OFF

Details

Power is not measured correctly when the level of a slot with set input level changes. In this case, this command sets the measurement results display.
When the ON parameter is set, the actual invalid measurement result value is output as is.
When the ON parameter is set, the measurement result is displayed as 999.99, indicating the measurement is invalid..

Example of Use

To set invalid output of the measurement result for an invalid section to ON:
TX_RX_INV_RSLT_OUT ON
TX_RX_INV_RSLT_OUT?
> ON

TX_RX_MW

Tx/Rx vs. Frequency Measurement - Measurement Window Offset & Measurement Window

Function

Sets or queries offset and measurement interval at Tx/Rx vs. Frequency measurement

Command

```
TX_RX_MW offset,meas_window
```

Query

```
TX_RX_MW?
```

Response

offset,meas_window

Parameter

offset	Offset
Range	0 to 75%
Resolution	1%
Default	25%
meas_window	Measurement interval
Range	1 to 90%
Resolution	1%
Default	55%

Details

Set the measurement window and offset as a proportional ratio (%) to the step duration.
Set the offset and measurement interval so that the total is less than 100%.

Example of Use

To set the offset of the measurement interval to 10 % and the measurement interval ratio to 80%:

TX_RX_MW 10,80
TX_RX_MW?
> 10,80

TX_RX_NUMSEG

Tx/Rx vs. Frequency Measurement - Segment Number

Function

Sets or queries number of segments at Tx/Rx vs. Frequency measurement

Command

```
TX_RX_NUMSEG seg
```

Query

```
TX_RX_NUMSEG?
```

Response

seg

Parameter

seg	Number of segments
Range	2 to 1600
Resolution	1
Default	2

Details

Set the parameter so that the product of the segment count and sequence count does not exceed 6400.

Example of Use

To set the number of segments to 10:

TX_RX_NUMSEG 10

TX_RX_NUMSEG?

> 10

TX_RX_NUMSEQ

Tx/Rx vs. Frequency Measurement - Sequence Number

Function

Sets or queries number of sequences at Tx/Rx vs. Frequency measurement

Command

```
TX_RX_NUMSEQ seq
```

Query

```
TX_RX_NUMSEQ?
```

Response

seq

Parameter

seq	Number of sequences
Range	1 to 400
Resolution	1
Default	1

Details

Set the parameter so that the product of the segment count and sequence count does not exceed 6400.

Example of Use

To set the number of sequences to 10:

TX_RX_NUMSEQ 10

TX_RX_NUMSEQ?

> 10

TX_RX_SEG_DURATION

Tx/Rx vs. Frequency Measurement - Segment Duration

Function

Sets or queries segment duration at Tx/Rx vs. Frequency measurement

Command

```
TX_RX_SEG_DURATION duration
```

Query

```
TX_RX_SEG_DURATION?
```

Response

duration

Parameter

duration		Segment duration
	Range	1 to 80 ms, WCDMA, CDMA2K, LTE
	Resolution	1 ms
	Default	20 ms

Details

If one of the standards is specified for the parameter, the segment duration is:
WCDMA: (10/15) ms, CDMA2K: 1.25 ms, LTE; 0.5 ms

Example of Use

To set the segment duration to 10 ms:
TX_RX_SEG_DURATION 10
TX_RX_SEG_DURATION?
> 10

TX_RX_TIMEOUT

Tx/Rx vs. Frequency Measurement - Trigger Timeout

Function

Sets or queries trigger timeout at Tx/Rx vs. Frequency measurement

Command

```
TX_RX_TIMEOUT timeout
```

Query

```
TX_RX_TIMEOUT?
```

Response

timeout

Unit	s

Parameter

timeout	Trigger timeout
Range	1 to 30 s
Resolution	1 s
Default	5 s

Example of Use

To set the trigger timeout to 10 s:

TX_RX_TIMEOUT 10

TX_RX_TIMEOUT?

> 10

TX_RX_TRG_DLY

Tx/Rx vs. Frequency Measurement - Trigger Delay

Function

Sets or queries trigger delay time at Tx/Rx vs. Frequency measurement

Command

```
TX_RX_TRG_DLY delay
```

Query

```
TX_RX_TRG_DLY?
```

Response

delay

Unit	ms

Parameters

delay	Trigger delay time
Range	0 to 1000.000 ms
Resolution	0.001 ms
Suffix code	NS, US, MS, S (uses ms when omitted)
Default	0.000 ms

Example of Use

To set the trigger delay time to 10.555 ms:

TX_RX_TRG_DLY 10.555

TX_RX_TRG_DLY?

> 10.555

TX_RX_TRG_LVL

Tx/Rx vs. Frequency Measurement - Trigger Level

Function

Sets or queries trigger level at Tx/Rx vs. Frequency measurement

Command

```
TX_RX_TRG_LVL level
```

Query

```
TX_RX_TRG_LVL?
```

Response

level

Unit	dB

Parameter

level	Trigger level
Range	–40 to 0 dB
Resolution	1 dB
Suffix code	DB (uses dB when omitted)
Default	–30 dB

Example of Use

To set the trigger level to –10 dB:

TX_RX_TRG_LVL -10

TX_RX_TRG_LVL?

> -10

ULFREQ

Uplink Frequency

Function

Sets or queries Rx frequency (uplink frequency) of MU887000A

Command

```
ULFREQ ul_freq
```

Query

```
ULFREQ?
```

Response

ul_freq

No suffix code, units: Hz

Parameter

ul_freq	Uplink frequency
Range	400.000000 to 6000.000000 MHz
Resolution	1 Hz
Suffix code	HZ, KHZ, KZ, MHZ, MZ, GHZ, GZ (uses Hz when omitted)
Default	2000 MHz

Examples of Use

To set the uplink frequency to 1950 MHz:

ULFREQ 1950MHZ

To query the uplink frequency:

ULFREQ?

>1950000000

Remarks

The uplink frequency is configured for a mobile station.

Changing the setting of the uplink frequency does not change the setting of the uplink channel.

WAVESPMON?

Spectrum Monitor - Data

Function

Queries spectrum data of spectrum monitor measurements
It is used to specify the position where the query begins and the number of points.

Query

```
WAVESPMON? format,position,length
```

Response

data(1),data(2),..,data(length)

Unit	dBm

Parameters

format	Format
2	Spectrum data of every point
position	Position where query of spectrum data begins
Range	If format is 2
	0 to (number of points of data – 1)
Resolution	1
Suffix code	No suffix code
length	Number of data read by spectrum data query
Range	If format is 2
	1 to (number of points of data – position value)
Resolution	1
Suffix code	No suffix code

Example of Use

When querying the spectrum data of the spectrum monitor,
to set the setting item to Spectrum monitor:
STDSEL COMMON
MEASSEL SPMON

To start measurement:
SNGLS
To query the spectrum data of spectrum monitor sampled in 501 points:
WAVESPMON? 2,0,501

Related Command

SPMWAVEPOINT is used to query the number of data points.

5.2.3 Sequence measurement commands

DLFREQ

Downlink Frequency

Function

Sets or queries Tx frequency (downlink frequency) of MU887000A

Command

```
DLFREQ dl_freq
```

Query

```
DLFREQ?
```

Response

dl_freq

No suffix code, units: Hz

Parameter

dl_freq	Downlink frequency
Range	400.000000 to 6000.000000 MHz
Resolution	1 Hz
Suffix code	HZ, KHZ, KZ, MHZ, MZ, GHZ, GZ (uses Hz when omitted)
Default	2140.000000 MHz

Examples of Use

To set the downlink frequency to 2050 MHz:

DLFREQ 2050MHZ

To query the currently configured downlink frequency:

DLFREQ?

>2050000000

Remarks

Changing the setting of the downlink frequency does not change the setting of the downlink channel.

ILVL

Input Level

Function

Sets or queries input level of MU887000A connector

Command

```
ILVL level
```

Query

```
ILVL?
```

Response

level

Unit	dBm

Parameter

level	Input level
Range	–65.0 to +35.0 dBm (Port1/Port2)
	–65.0 to +25.0 dBm (Port3/Port4)
Resolution	0.1 dB
Suffix code	DBM (uses dBm when omitted)
Default	–10.0 dBm

Details

The setting range varies with the input port setting.
When the Cable Loss Calibration is ON, the cable loss is added to the input level setting range.
When the cable loss is 5 dB, the Port1/Port2 setting range is –60.0 to +40.0 dBm.

Examples of Use

To set the input level to –10.0 dBm:
ILVL -10.0

To query the currently configured input level:
ILVL?
> -10.0

Related Commands

EXTLOSSW
LOSSTBL
LOSSTBLVAL
For details of the commands, refer to Chapter 6 “Native Command Reference” in the *MU887000A TRX Test Module Operation Manual*.

OLVL

Output Level

Function

Sets or queries RF signal level output of MU887000A connector

Command

```
OLVL level
```

Query

```
OLVL?
```

Response

level

Unit	dBm

Parameter

level	Output level
Range	–130.0 to –10.0 dBm (Port1/Port2)
	–120.0 to 0.0 dBm (Port3/Port4)
Resolution	0.1 dB
Suffix code	DBM (uses dBm when omitted)
Default	–60.0 dBm

Details

The setting range varies with the output port setting.
When the Cable Loss Calibration is ON, the cable loss is subtracted from the output level setting range.
When the cable loss is 5 dB, the Port1/Port2 setting range is –135.0 to –15.0 dBm.

Examples of Use

To set the output level to –50.0 dBm:
OLVL -50.0

To query the currently configured output level:
OLVL?
> -50.0

Related Commands

EXTLOSSW
LOSSTBL
LOSSTBLVAL

For details of the commands, refer to Chapter 6 “Native Command Reference” in the *MU887000A TRX Test Module Operation Manual*.

RXFREQ

Downlink Frequency

Function

Sets or queries RX frequency (downlink frequency) of mobile station

Command

```
RXFREQ dl_freq
```

Query

```
RXFREQ?
```

Response

dl_freq

Parameter

dl_freq	Downlink frequency
Range	400.000000 to 6000.000000 MHz
Resolution	1 Hz
Suffix code	HZ, KHZ, KZ, MHZ, MZ, GHZ, GZ (uses Hz when omitted)
Default	2140.000000 MHz

Examples of Use

To set the downlink frequency to 2120 MHz:
RXFREQ 2120MHZ

To query the currently configured downlink frequency:
RXFREQ?
>2120000000

SEQCTRL

Sequence Control Parameter - Sequence Table

Function

Sets or queries start and stop segments in sequence table.
Sets the parameters for both measurement and signal transmission.

Command

```
SEQCTRL start,end
```

Query

```
SEQCTRL?
```

Response

start,end

Parameters

start	Start segment
Range	0 to 1999
Resolution	1
Default	0
end	Stop segment
Range	start to 1999
Resolution	1
Default	0

Details

Start = 0 to 1999, end = 0 to 1999 where end ≥ start
Whether the set sequence table can be executed is evaluated.
Use the SEQERR? command to query the error details.

Related Command

To set the start and stop segments to 20 and 55, respectively:
SEQCTRL 20,55
SEQCTRL?
> 20,55

SEQCTRLTX

Sequence Control Parameter - Sequence Control

Function

Sets or queries start and stop segments in sequence table.

Sets the measurement parameters only, without affecting the signal transmission parameters.

Command

```
SEQCTRLTX start,end
```

Query

```
SEQCTRLTX?
```

Response

```
start,end
```

Parameters

start	Start segment
Range	0 to 1999
Resolution	1
Default	0
end	Stop segment
Range	start to 1999
Resolution	1
Default	0

Details

Start = to 1999, end = 0 to 1999 where end ≥ start

Whether the set sequence table can be executed is evaluated. Use the SEQERR? command to query the error details.

Examples of Use

To set the start and stop segments to 20 and 55, respectively:

SEQCTRLTX 20,55

SEQCTRLTX?

> 20,55

SEQERR?

Sequence Parameter Information - Error Check

Function

Queries setting error information of sequence table

Query

```
SEQERR? [item]
```

Response

Query parameter	Response
(no parameter)	n,err(0),..,err(n–1)
ILVL, OLVL, STEP, DLPAT, PORT:	ns,seg(0),..,seg(ns–1)
LEN:	e,mem,exe,set
OLVLNUM, PATNUM, STDNUM:	e,exe,set

If no error is found in the sequence table, the response returns 0.

Parameters

item	Parameter of sequence table	
ILVL	Input level	
OLVL	Output level	
STEP	Step count	
DLPAT	Waveform Pattern	
PORT	Port	
LEN	Capture memory length	
OLVLNUM	Output level change count	
PATNUM	Waveform pattern change count	
STDNUM	Measurement mode change count	
n	Number of errors	
Range	0 to 4	
err	Parameter with errors	
ILVL	Input level	
OLVL	Output level	
STEP	Step count	
LEN	Capture memory length	
ns	Number of segments with errors	
Range	0 to 2000	
seg	Segment number with errors	
Range	0 to 1999	
e	Presence of errors	
Range	0	No errors, executable
	1	Errors found, not executable

mem	Memory utilization
Range	0.0% to 100.0%
Resolution	0.1%
exe	Number of segments capable of executing capture out of number of segments configured
Range	1 to 2000
set	Number of segments with capture configured
Range	1 to 2000

Details

This command can check error presence of input level, output level, step count, and capture memory length.
To query error presence of the following parameters, use SEQERR2? command.
Waveform pattern, port output level change count, waveform pattern change count, measurement mode change count.

To set parameters for sequence table using the following commands, errors are not checked.
SEQTRX, SEQTX, SEQMEAS

Examples of Use

To query the presence of errors:
SEQERR?
>1,ILVL

To query input level setting error information:
SEQERR? ILVL
>2,3,12

To query capture memory error information:
SEQERR? LEN
>0,25.0,20,20
The capture memory utilization is 25.0% so that all captures configured in twenty segments are executable.

Remarks

Sequence measurement cannot be started if there are errors.
However, sequence measurement can be started if segment numbers with errors are excluded from the execution range using the SEQCTRL command.

SEQERR2?

Sequence Parameter Information - Error Check

Function

Queries setting error information of sequence table

Query

```
SEQERR2? format
```

Response

n,err(0),..,err(n-1)

If no error is found in the sequence table, the response returns 0.

Parameters

format	Format
1	Error check 1
n	Number of errors
Range	0 to 7
err(n-1)	Parameter with errors
ILVL	Input level
OLVL	Output level
STEP	Step count
DLPAT	Waveform Pattern
PORT	Port
LEN	Capture memory length
OLVLNUM	Output level change count
PATNUM	Waveform pattern change count
STDNUM	Measurement mode change count

Details

Parameter setting errors can be checked up to seven types.
Only one of output level change count, waveform pattern change count, or measurement mode change count has an error.
Two or three of them cannot have an error simultaneously.

To set parameters for sequence table using the following commands, errors are not checked.
SEQTRX, SEQTX, SEQMEAS, SEQSGPORT
To query error details of each parameter, use SEQERR command.

Examples of Use

To query the presence of errors:
SEQERR2? 1
>2,ILVL,DLPAT

Remarks

Sequence measurement cannot be started if there are errors.
However, sequence measurement can be started if segment numbers with errors are excluded from the execution range using the SEQCTRL command.

SEQEXECTX

Start Signal Analyzer Measurement Only

Function

Sets only the parameters for the specified measurement and executes measurement, without affecting the signal transmission parameters.

Command

```
SEQEXECTX
```

SEQMEAS

Sequence Table Parameter - Measurement

Function

Sets or queries measurement conditions of segments

Command

```
SEQMEAS seg,mode,step,mcond
```

Query

```
SEQMEAS? seg
```

Response

mode,step,mcond

Parameters

seg	Segment number	
Range	0 to 1999	
Resolution	1	
mode	Measurement mode	Requires software license
TXP	TX Power measurement mode	MX887010A
WCDMA	W-CDMA measurement mode	MX887010A and MX887011A
GSM	GSM measurement mode	MX887010A and MX887012A
CDMA2K	CDMA2000 1x measurement mode	MX887010A and MX887015A
EVDO	CDMA2000 1xEVDO measurement mode	MX887010A and MX887016A
LTE	LTE measurement mode	MX887010A and MX887013A, or MX887010A and MX887014A
TDSCDMA	TD-SCDMA measurement mode	MX887010A and MX887017A
Default	TXP	
step	Step count	
Range	2 to 3000	
Resolution	1	
Default	2	
mcond	Measurement condition number	
Range	0 to 1999	
Resolution	1	
Default	0	

Example of Use

To set the parameters for segment 2 as follows:

Measurement mode: GSM, Step count: 10, Measurement conditions number: 3

SEQMEAS 2, GSM,10,3

SEQMEAS? 2

> GSM,10,3

SEQMSTAT?

Sequence Measurement Status

Function

Queries status of sequence measurement.

Query

```
SEQMSTAT?
```

Response

m_status,n,s(0),s(1),..,s(n–1)

Parameters

m_status	Measurement progress status
0	Measurement completed successfully
2	Level over
3	Under level
4	Measurement failed
5	Synchronization word not detected
9	Measurement in progress or not measured
12	Timeout of Tx measurement
The value received from MX887010A is 0, 2, 9, or 12.	
n	Number of segments measured
Range	0 to 2000
s(n-1)	Segment measurement status
0	Measurement completed successfully
2	Level over
3	Under level
4	Measurement failed
5	Synchronization word not detected
9	Measurement in progress or not measured
10	Segment not to be measured
12	Timeout of Tx measurement
The value received from MX887010A is 0, 2, 9, 10, or 12.	

Example of Use

SEQMSTAT?

>2,6,0,0,0,0,2,0

The result shows that six segments are measured and the fifth segment is over level.

Related Commands

MSTAT

SEQSEGSTAT

SEQPROGRESS?

Sequence progress

Function

Queries progress rate of sequence measurement and currently operating sequence number

Query

```
SEQPROGRESS?
```

Response

```
p,cur,start,end
```

Parameters

p	Progress rate of sequence measurement
Range	0% to 100%
cur	Segment number currently in progress
Range	0 to 1999
start	Segment number where first measurement executed
Range	0 to 1999
end	Segment number where end measurement executed
Range	0 to 1999

Example of Use

SEQPROGRESS?

>65,23,11,30

Remarks

The segment number where measurement is executed first and the segment number where measurement is executed last are the same as the start and stop segment numbers configured using the SEQCTRL command.

SEQREINIT

Sequence Control Parameter - Sequence End State Reinitialization

Function

Sets initialization of following items after completion of sequence

- Downlink frequency
- Output level
- Output waveform pattern
- Uplink frequency
- Input level

It queries the initialization settings of the parameters after completion of the sequence.

Command

```
SEQREINIT sw
```

Query

```
SEQREINIT?
```

Response

sw

Parameter

sw	Initialization process after sequence completion
ON	Resets target parameters
OFF	Holds last segment settings
Default	ON

Details

If the parameter is set to ON, the settings are initialized to the values configured by the following commands after the sequence completion.

Downlink frequency	DLFREQ
Output level	OLVL
Output waveform pattern	DLPAT
Uplink frequency	ULFREQ
Input level	ILVL

If the parameter is set to OFF, these settings remain those of the sequence stop segment.

Example of Use

To initialize after sequence completion:

SEQREINIT ON

SEQREINIT?

> ON

SEQSEGSTAT?

Specified Segment Status

Function

Specifies segment number for querying segment measurement status

Query

```
SEQSEGSTAT? seg
```

Response

stat

Parameters

seg	Segment number
Range	0 to 1999
stat	Segment status
0	Measurement completed successfully
2	Level over
3	Under level
4	Measurement failed
5	Synchronization word not detected
9	Measurement in progress or not measured
10	Segment not to be measured
12	Timeout of Tx measurement

The value received from MX887010A is 0, 2, 9, 10, or 12.

Example of Use

To query the status of segment 16:

SEQSEGSTAT 16

> 0

SEQSGPORT

Sequence Table Parameter - SG Output Port

Function

Specifies segment numbers to set or query numbers of test ports transmitting RF signals

Command

```
SEQSGPORT seg,port
```

Query

```
SEQSGPORT? seg
```

Response

port

Parameters

seg	Segment number
Range	0 to 1999
port	Port number
PORT1	PORT 1
PORT2	PORT 2
PORT3	PORT 3
PORT4	PORT 4
Default	PORT1

Details

PORT3 cannot be set when PORT3 is selected for RF signal input port.

PORT4 cannot be set when PORT4 is selected for RF signal input port.

Example of Use

To set the port number of segment 5 to 2:

SEQSGPORT 5, PORT2

SEQSGPORT? 5

> PORT2

SEQTBL

Sequence Control Parameter - Sequence Table

Function

Sets or queries number of sequence table to operate

Command

```
SEQTBL table
```

Query

```
SEQTBL?
```

Response

table

Parameter

table	Sequence table number
Range	0 to 3
Resolution	1
Default	0

Example of Use

To select sequence table 1:

SEQTBL 1

SEQTBL?

> 1

SEQTRG

Sequence Table Parameter - Trigger

Function

Sets or queries trigger conditions to start sequence measurement

Command

```
SEQTRG seg,src,slope,level,delay
```

Query

```
SEQTRG? seg
```

Response

src,slope,level,delay

Parameters

seg	Segment number
Range	0 to 1999
src	Trigger source
FRAME	Frame
FREERUN	Free run
PWR	Input signal power
Default	FREERUN
slope	Trigger slope
RISE	Trigger at rising
Default	RISE
level	Trigger level
Range	–40 to 0 dB
Resolution	1 dB
Suffix code	DB (uses dB when omitted)
Default	–30 dB
delay	Delay time
Range	0 to 1000.000 ms
Resolution	0.001 ms
Suffix code	NS, US, MS, S (uses ms when omitted)
Default	0.000 ms

Details

The trigger slope and trigger level are enabled when the trigger source is set to PWR.

Example of Use

To set the trigger conditions for segment 2 as follows:

Trigger source: PWR, Trigger slope: RISE, Trigger level: –30 dB, Delay time: 0

SEQTRG 2,PWR,RISE, -30,0
SEQTRG? 2
> PWR,RISE,-30,0.000

Remarks

The trigger level is the level difference from the input level configured using the following command.
ILVL, SEQTRX

SEQTRX

Sequence Table Parameter - TRX Control

Function

Sets or queries following items in sequence table
- Uplink frequency
- Input level
- Downlink frequency
- Output level
- Waveform pattern

Command

```
SEQTRX seg,ul_freq,ref,dl_freq,level,pat
```

Query

```
SEQTRX? seg
```

Response

ul_freq,ref,dl_freq,level,pat

Parameters

seg	Segment number
Range	0 to 1999
Resolution	1
ul_freq	Rx frequency (uplink)
Range	400.000000 to 6000.000000 MHz
Resolution	0.000001 MHz
Suffix code	HZ, KHZ, KZ, MHZ, MZ, GHZ, GZ (uses MHz when omitted)
Default	1950.000000 MHz
ref	Input level
Range	–65.0 to +35 dBm (Port1/Port2) –65.0 to +25 dBm (Port3/Port4)
Resolution	0.1 dB
Suffix code	DBM (uses dBm when omitted)
Default	–10.0 dBm
dl_freq	TX frequency (downlink)
Range	400.000000 to 6000.000000 MHz
Resolution	0.000001 MHz
Suffix code	HZ, KHZ, KZ, MHZ, MZ, GHZ, GZ (uses MHz when omitted)
Default	2140.000000 MHz

level		Output level
	Range	–130.0 to –10.0 dBm (Port1/Port2)
		–120.0 to 0.0 dBm (Port3/Port4)
	Resolution	0.1 dB
	Suffix code	DBM (uses dBm when omitted)
	Default	–60.0 dBm
pat		Transmission signal pattern
	PAT1 to PATn	Pattern number (n: waveform information file group range)
	CW	Modulation turned OFF
	OFF	Output level turned OFF
	NC	Transmission signal pattern not configured in this segment (transmission signal pattern currently configured is maintained)
	Default	CW

Details

The setting range varies with the input/output port setting.

If Cable Loss Correction is ON, the cable loss is added to the range of the input level and subtracted from the range of output level.

If the cable loss is 5 dB, the input and output levels are as follows:

Input level –60.0 to +40 dBm

Output level –135.0 to –15.0 dBm

In this case, if the output level is set to –10.0 dBm, an out-of-parameter setting range error occurs.

Whether an out-of-parameter setting range error has occurred is determined during execution of the following commands:

SEQCTRL, SNGLS, SEQEXECTX

A measurement execution error occurs when an out-of-range error occurs.

SEQERR? is used to query the details of errors.

The pattern number is the same as the group number. Refer to Chapter 3, “Waveform File Details” in the *Waveform Files for Cellular Application Operation Manual.*

Example of Use

To set segment 0 as follows:

Uplink frequency set to 1950.0 MHz, input level to –10.0 dBm, downlink frequency set to 2140.0 MHz, output level set to –60.0 dBm, and no modulation:

SEQTRX 0,1950.000000, -10.0,2140.000000, -60.0,CW

SEQTRX? 0

> 1950.000000,-10.0,2140.000000,-60.0,CW

Remark

The group range is the selected waveform file.

For the waveform pattern details, refer to Chapter 3, “Waveform File Details” in the *Waveform Files for Cellular Application Operation Manual.*

SEQTX

Sequence Table Parameter - Uplink Frequency, Input Level

Function

Sets or queries uplink frequency and input level of segments in sequence table.

Command

```
SEQTX seg,ul_freq,ref
```

Query

```
SEQTX? seg
```

Response

```
ul_freq,ref
```

Parameter

seg	Segment number
Range	0 to 1999
Resolution	1
ul_freq	Rx frequency (uplink)
Range	400.000000 to 6000.000000 MHz
Resolution	0.000001 MHz
Suffix code	HZ, KHZ, KZ, MHZ, MZ, GHZ, GZ (uses MHz when omitted)
Default	1950.000000 MHz
ref	Input level
Range	–65.0 to +35 dBm (Port1/Port2) –65.0 to +25 dBm (Port3/Port4)
Resolution	0.1 dB
Suffix code	DBM (uses dBm when omitted)
Default	–10.0 dBm

Details

This command sets only the uplink frequency and input level among the parameters that are set by SEQTRX.
The setting range varies with the input port setting.
When the Cable Loss Calibration is ON, the cable loss is added to the input level setting range.
When the cable loss is 5 dB, the Port1/Port2 setting range is –60.0 to +40.0 dBm.
Whether an out-of-parameter setting range error has occurred is determined during execution of the following commands:
SEQCTRL, SNGLS, SEQEXECTX

Example of Use

To set the parameters for segment 1 as follows:
Uplink frequency: 1950 MHz, Input level: –10.0 dBm
SEQTX 1,1950,-10.0
SEQTX? 1
> 1950.000000,-10.0

TRGTOUT

Trigger Timeout

Function

Sets and queries the trigger timeout

Command

`TRGTOUT time`

Query

`TRGTOUT?`

Response

time	
Unit	s

Parameter

time	Timeout time
Range	1 to 60 s
Resolution	1 s
Suffix code	NS, US, MS, S (uses s when omitted)
Default	10 s

Example of Use

To set the Trigger timeout time to 10 seconds:
TRGTOUT 10
TRGTOUT?
> 10

TXFREQ

Uplink Frequency

Function

Sets or queries Tx frequency (uplink frequency) of mobile station

Command

```
TXFREQ ul_freq
```

Query

```
TXFREQ?
```

Response

ul_freq

Parameter

ul_freq	Uplink frequency
Range	400.000000 to 6000.000000 MHz
Resolution	1 Hz
Suffix code	HZ, KHZ, KZ, MHZ, MZ, GHZ, GZ (uses Hz when omitted)
Default	1950.000000 MHz

Examples of Use

To set the uplink frequency to 1950 MHz:
TXFREQ 1950MHZ

To query the uplink frequency:
TXFREQ?
>1950000000

TXPWR_BW

Tx Power - Bandwidth

Function

Sets or queries measurement bandwidth at Tx Power measurement

Command

```
TXPWR_BW bw
```

Query

```
TXPWR_BW?
```

Response

bw

Parameter

bw	Measurement bandwidth
20MHZ	20 MHz
15MHZ	15 MHz
10MHZ	10 MHz
5MHZ	5 MHz
3MHZ	3 MHz
1.4MHZ	1.4 MHz
G1MHZ	Gauss 1 MHz
WCDMA	WCDMA RRC (3.84 MHz)
CDMA2K	CDMA2000 (1.2288 MHz)
Default	5 MHZ

Example of Use

To set the measurement bandwidth at Tx Power measurement to 20 MHz:

TXPWR_BW 20MHZ

TXPWR_BW?

> 20MHZ

5 Native Command Reference

TXPWR_MW

Tx Power - Measurement Window Offset and Window Length

Function

Sets or queries measurement interval and offset at Tx Power measurement

Command

```
TXPWR_MW offset,mw
```

Query

```
TXPWR_MW?
```

Response

offset,mw

Parameters

offset	Offset of measurement interval
Range	0 to 75%
Resolution	1%
Default	25%
mw	Measurement interval
Range	25 to 95%
Resolution	1%
Default	55%

Details

The measurement interval and its offset are specified as a proportional ratio (%) to the segment duration.
Set the offset and the measurement interval so that the total is less than 100%.

Example of Use

To set the ratios of the measurement interval and measurement interval offset at Tx Power measurement to 55% and 25%, respectively:
TXPWR_MW 25,55
TXPWR_MW?
> 25,55

TXPWR_OLVL

Tx Power - Output Level Pattern Select

Function

Sets or queries output level patterns at Tx Power measurement

Command

```
TXPWR_OLVL mcond,pat
```

Query

```
TXPWR_OLVL? mcond
```

Response

pat

Parameter

mcond	Measurement condition number
Range	0 to 1999
Resolution	1
pat	Output level pattern
NORM	Level set to segment
PAT0	Output level pattern 0
PAT1	Output level pattern 1
PAT2	Output level pattern 2
PAT3	Output level pattern 3
…	…
PAT1999	Output level pattern 1999
Default	NORM

Details

If the output level pattern is set to NORM, the signal is output at the level set for the corresponding segment in the sequence table.

Example of Use

To set the output level pattern for measurement condition 0 at Tx Power measurement to pattern 1:

TXPWR_OLVL 0,PAT1
TXPWR_OLVL? 0
> PAT1

Related Commands

If the pattern is set to NORM, the SEQTRX command is used to set the output level.
The following commands are used to set the output levels of patterns 0 to 3:
TXPWR_OPAT0
TXPWR_OPAT1

TXPWR_OPAT0

Tx Power - System Output Level Pattern Definition (0 to 99)

Function

Sets or queries output level pattern values at Tx Power measurement

The setting range of values starts at the beginning of the output level patterns and the number of values set does not exceed 100.

Command

```
TXPWR_OPAT0 pat,level0[,level1[,…[,level99]…]]]
```

Query

```
TXPWR_OPAT0? pat
```

Response

level0,level1,...,level99

Unit	dBm

Parameters

pat	Output level pattern
PAT0	Pattern 0
PAT1	Pattern 1
PAT2	Pattern 2
PAT3	Pattern 3
...	...
PAT1999	Output level pattern 1999
Default	PAT0
level0	Output level of step 0
level1	Output level of step 1
:	:
level98	Output level of step 98
level99	Output level of step 99
Range	–130.0 to –10.0 dBm (Port1/Port2) –120.0 to 0.0 dBm (Port3/Port4)
Resolution	0.1 dB
Suffix code	DBM
Default	–120.0 dBm

Details

level1 and subsequent levels can be omitted.
If the cable loss correction is set to ON, the setting range of the output level varies with the correction data value setting.
For example, if the correction data is 10 dB, the setting range of output level is between –140.0 and –20.0 dBm.
In this case, if the parameter is set to –10.0 dBm, an "out of parameter setting range" error occurs.
Whether an out-of-parameter setting range error has occurred is determined during execution of the following commands:
SEQCTRL, SNGLS
A measurement execution error occurs when an out-of-range error occurs.
SEQERR? is used to query the details of errors.

Example of Use

To set four output levels starting at the beginning output level of output level pattern 0 to –30.0, –40.0, –50.0, and –60.0, respectively:
TXPWR_OPAT0 PAT0,-30.0,-40.0,-50.0,-60.0
TXPWR_OPAT0? PAT0
> -30.0,-40.0,-50.0,-60.0,-120.0,...,-120.0,-120.0*
*: Actually, 100 items are always returned even if not omitted.

TXPWR_OPAT1

Tx Power - System Output Level Pattern Definition (50 to 99)

Function

Sets or queries output level patterns at Tx Power measurement

The setting range of values is between number 50 and number 99 of the output level pattern.

Command

```
TXPWR_OPAT1 pat,level50[,level51[,…[,level99]…]]
```

Query

```
TXPWR_OPAT1? pat
```

Response

level50,level51,...,level99

Unit	dBm

Parameters

pat	Output level pattern
PAT0	Pattern 0
PAT1	Pattern 1
PAT2	Pattern 2
PAT3	Pattern 3
...	...
PAT1999	Output level pattern 1999
Default	PAT0
<level50>	Output level of step 50
<level51>	Output level of step 51
:	:
<level98>	Output level of step 98
<level99>	Output level of step 99
Range	–130.0 to –10.0 dBm (Port1/Port2)
	–120.0 to 0.0 dBm (Port3/Port4)
Resolution	0.1 dB
Suffix Code	DBM (uses dBm when omitted)
Default	–120 dBm

Details

Level51 and subsequent levels can be omitted.
If the cable loss correction is set to ON, the setting range of the output level varies depending on the correction data value setting.
For example, if the correction data is 10 dB, the output level setting range is between –140.0 and –20.0 dBm.
In this case, if the parameter is set to –10.0 dBm, an "out of parameter setting range" error occurs.
Whether an out-of-parameter setting range error has occurred is determined during execution of the following commands:
SEQCTRL, SNGLS
A measurement execution error occurs when an out-of-range error occurs.
SEQERR? is used to query the details of errors.

Example of Use

To set output levels of number 50 to number 53 for output level pattern 0 to –30.0, –40.0, –50.0, and –60.0, respectively.
TXPWR_OPAT1 PAT0,-30.0,-40.0,-50.0,-60.0
TXPWR_OPAT1? PAT0
> -30.0,-40.0,-50.0,-60.0,-120.0,…,-120.0,-120.0*
*: Actually, 50 items are always returned even if not omitted.

Remarks

The command is compatible with the existing MT8820C. If output levels of number 50 to number 99 for the output level pattern are configured using TXPWR_OPAT0, the command described above updates output levels of number 50 to number 99 for the output level pattern.

TXPWR_PWR_ALL?

Tx Power - Power

Function

Specifies segment number to query all measurement results at Tx Power measurement

Query

```
TXPWR_PWR_ALL? [mode]
```

Response

When mode is omitted: s1,p(0),p(1),..,p(s1–1)
When AVG is specified: s2,p_ave(0),p_ave(1),..,p_ave(s2–1)

Unit s1, s2 : No units, p, p_ave: dBm

Parameters

mode	Measurement mode
AVG	Average
Default	AVG
s1	Number of measurement steps
Range	1 to 400000
Resolution	1
s2	Number of measurement steps
Range	1 to 2000
Resolution	1
p(s1–1)	Power of step (s1–1)
Resolution	0.01 dB
p_ave(s2–1)	Average power of segment (s2–1)
Resolution	0.01 dB

Example of Use

To query average of all measurement results at Tx Power measurement
TXPWR_PWR_ALL? AVG
>20,-36.18,-38.34,-39.06,-36.61,....

TXPWR_PWR?

Tx Power - Power

Function

Specifies segment number to query measurement result at Tx Power measurement

Query

```
TXPWR_PWR? Seg[,mode]
```

Response

When mode is omitted: s,p(0),p(1),..,p(s–1)
When AVG is specified: p_ave

Unit	s : No units, p, p_ave : dBm

Parameters

seg	Segment number
Range	0 to 1999
Resolution	1
mode	Measurement mode
AVG	Average
Default	AVG
s	Number of measurement steps
Range	1 to 200
Resolution	1
p(s–1)	Power of step i
Resolution	0.01 dB
p_ave	Average power of segment
Resolution	0.01 dB

Example of Use

To query Tx Power measurement result for segment number 10:
TXPWR_PWR? 10
>20,-36.18,-38.34,-39.06,-36.61,....

TXPWR_SCOUNT

Tx Power - Step Count

Function

Specifies measurement condition numbers to set or query number of measurement steps at Tx Power measurement

Command

```
TXPWR_SCOUNT mcond,count
```

Query

```
TXPWR_SCOUNT? mcond
```

Response

count

Parameters

mcond	Measurement condition number
Range	0 to 1999
Resolution	1
count	Number of measurement steps
Range	1 to 200
Resolution	1

Example of Use

To set the number of measurement steps of measurement condition number 3 to 15:

TXPWR_SCOUNT 3,15

TXPWR_SCOUNT? 3

> 15

TXPWR_STIME

Tx Power - Step Time

Function

Sets or queries time per step at Tx Power measurement

Command

```
TXPWR_STIME stime
```

Query

```
TXPWR_STIME?
```

Response

stime

Unit	ms

Parameter

stime	Step length	
Range	1 to 80 ms, WDCMA, CDMA2K LTE,GSM	
	WCDMA:	0.667 ms (10/15 ms)
	CDMA2K:	1.25 ms
	LTE :	0.5 ms
	GSM :	0.577 ms (15/26 ms)
Resolution	1 ms	
Default	20 ms	

Example of Use

To set the step length at Tx Power measurement to 20 ms:

TXPWR_STIME 20

TXPWR_STIME?

> 20

ULFREQ

Uplink Frequency

Function

Sets or queries Rx frequency (uplink frequency) of MU887000A

Command

```
ULFREQ ul_freq
```

Query

```
ULFREQ?
```

Response

ul_freq

No suffix code, units: Hz

Parameter

ul_freq	Uplink frequency
Range	400.000000 to 6000.000000 MHz
Resolution	1 Hz
Suffix code	HZ, KHZ, KZ, MHZ, MZ, GHZ, GZ (uses Hz when omitted)
Default	1950 MHz

Example of Use

To set the uplink frequency to 1950 MHz:

ULFREQ 1950MHZ

To query the uplink frequency:

ULFREQ?

>1950000000

Appendix A　Specifications

This section describes the MX887010A specifications. Refer to Section 1.2 “Product Configuration”.

These specifications assume use of the system at a constant temperature after warming-up the instruments for 30 minutes.

Table A-1　Common Settings

Items	Specifications
Measurement Signal	WCDMA/GSM/LTE/TD-SCDMA Uplink signal, CDMA2000/EVDO Reverse link signal
Frequency	400 to 6000 MHz

Table A-2　Fundamental Settings

<table>
<tr><th>Items</th><th>Specifications</th></tr>
<tr><td>Spectrum monitor</td><td></td></tr>
<tr><td>Analysis time</td><td>1,10 ms</td></tr>
<tr><td>Span</td><td>1, 2.5, 5, 10, 25, 50, 100, 160 MHz</td></tr>
<tr><td>Resolution</td><td>
<table>
<tr><th>Span</th><th>Resolution</th></tr>
<tr><td>1 MHz</td><td>100 Hz, 300 Hz, 1 kHz, 3 kHz, 10 kHz</td></tr>
<tr><td>2.5 MHz</td><td>1 kHz, 3 kHz, 10 kHz, 30 kHz</td></tr>
<tr><td>5 MHz</td><td>3 kHz, 10 kHz, 30 kHz, 100 kHz</td></tr>
<tr><td>10 MHz</td><td>3 kHz, 10 kHz, 30 kHz, 100 kHz</td></tr>
<tr><td>25 MHz</td><td>10 kHz, 30 kHz, 100 kHz, 300 kHz</td></tr>
<tr><td>50 MHz</td><td>30 kHz, 100 kHz, 300 kHz, 1 MHz</td></tr>
<tr><td>100 MHz</td><td>30 kHz, 100 kHz, 300 kHz, 1 MHz</td></tr>
<tr><td>160 MHz</td><td>30 kHz, 100 kHz, 300 kHz, 1 MHz</td></tr>
</table>
</td></tr>
<tr><td>Detection mode</td><td>Peak, RMS</td></tr>
<tr><td>Power measurement bandwidth</td><td>Setting range: 0.001 MHz to (Span) MHz
Resolution: 0.001 MHz</td></tr>
</table>

Table A-2 Fundamental Settings (Cont'd)

Items	Specifications
Multiple power measurement	
Step count	10 to 100
Step length	0.5, 1, 2, 4, 5, 10, 20, 30, 40, 50, 60, 70, 80 ms
Filter Type	Low Pass Filter: 1.23 MHz, 1.4 MHz, 3 MHz, 5 MHz, 10 MHz, 15 MHz, 20 MHz RRC Filter: 3.84 MHz
Measurement interval	1 to 90%, Resolution 1 %
Trigger level	–40 to 0 dB*
Tx/Rx vs. Frequency	
Segment duration	1 to 80 ms, Resolution 1 ms, WCDMA, CDMA2K, LTE
Filter Type	Low Pass Filter: 1.23 MHz, 1.4 MHz, 3 MHz, 5 MHz, 10 MHz, 15 MHz, 20 MHz RRC Filter: 3.84 MHz
Measurement interval	1 to 90%, Resolution 1 %
Segment count	1 to 1600
Sequences Count	1 to 400
Narrowband power vs. Time	
Segment duration	200 to 20000 μs, Resolution 1 μs
Measurement Band Width	15 kHz
Offset	0 to 90%, Resolution 1 %
Segment count	1 to 1000
IQ Capture	
Time span	1000 to 10000 μs, Resolution 1 μs
Measurement bandwidth	Low Pass Filter: 100 kHz, 300 kHz, 500 kHz, 1 MHz, 3 MHz, 5 MHz, 20 MHz Gaussian Filter: 1 MHz

*: Based on the Input Level value

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