

MX269010A
Mobile WiMAX Measurement Software
Operation Manual
Remote Control

11th Edition


- For safety and warning information, please read this manual before attempting to use the equipment.
- Additional safety and warning information is provided within the MS2690A/MS2691A/MS2692A Signal Analyzer Operation Manual (Mainframe Operation) or MS2830A Signal Analyzer Operation Manual (Mainframe Operation) and MX269010A Mobile WiMAX Measurement Software Operation Manual (Operation). Please also refer to either of these documents before using the equipment.
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MX269010A
Mobile WiMAX Measurement Software
Operation Manual Remote Control

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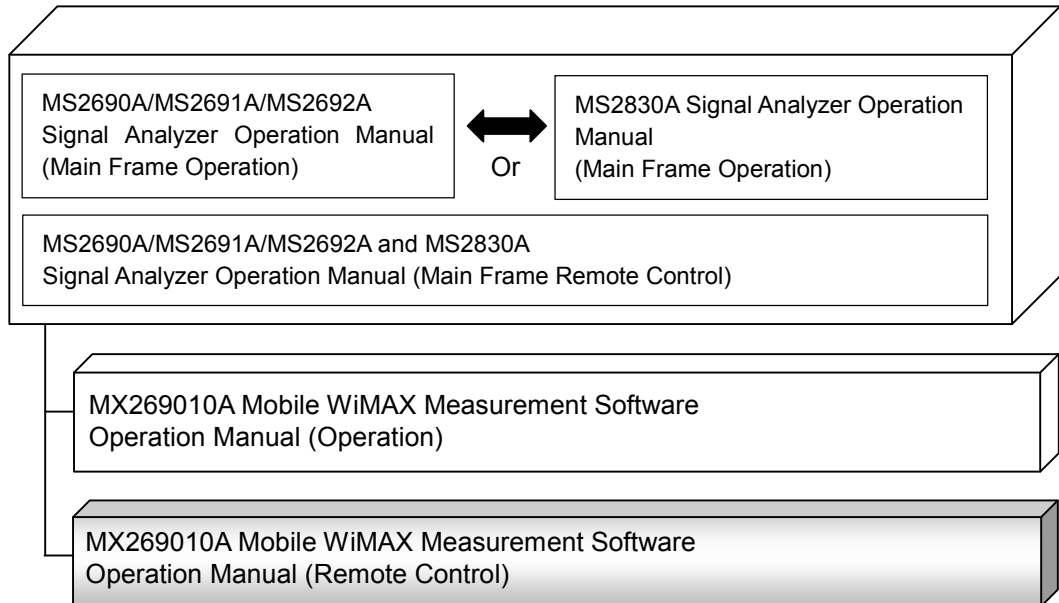
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About This Manual

■ Composition of Operation Manuals

The operation manuals for the MX269010A Mobile WiMAX Measurement Software are comprised as shown below.



- Signal Analyzer Operation Manual (Mainframe Operation)
- Signal Analyzer Operation Manual (Mainframe Remote Control)

These manuals describe basic operating methods, maintenance procedures, common functions, and common remote control of the signal analyzer mainframe.

- Mobile WiMAX Measurement Software Operation Manual (Operation)
- Mobile WiMAX Measurement Software Operation Manual (Remote Control)

<This document>

These manuals describe basic operating methods, functions, and remote control of the Mobile WiMAX Measurement Software.

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Chapter 1 Basics of Remote Control

This chapter provides an overview of the remote control of the MX269010A Mobile WiMAX measurement software (hereinafter, referred to as “MX269010A”).


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1.1 Overview

The MX269010A can perform remote control by transmitting the defined command/query/response through the MS269x Series or MS2830A Signal Analyzer.

1.1.1 Interface

The MX269010A supports GPIB, Ethernet, and USB as an interface for remote control, but only one of the three can be used at one time.

The interface receiving a command of a communication start from an external controller (PC) is automatically selected from among the interfaces when the MS2690A/MS2691A/MS2692A or MS2830A is in Local mode. Once the interface is decided, the MS2690A/MS2691A/MS2692A or MS2830A shifts to Remote mode. When  on the front panel is turned off, it indicates “Local”, and when turned on, it indicates “Remote”.

Please refer to the “MS2690A/MS2691A/MS2692A and MS2830A Signal Analyzer Operation Manual (Mainframe Remote Control)” for the explanations about the basics of remote control, including how to set the interface.

1.1.2 Control target application

There are two types of remote control commands used. One is a command applied to the MS2690A/MS2691A/MS2692A or MS2830A itself and all other applications (hereinafter, referred to as “common command”).

The other is a command unique to the MS2690A/MS2691A/MS2692A or MS2830A. The common command can be executed irrespective of the type of the selected application. On the other hand, a command unique to an application is only enabled for the application of the control target. If an application which is not a control target is selected, an error will occur or the command cannot be executed for the application of a control command.

Two or more applications can be executed simultaneously. Only one application can be executed at one time, per one hardware resource. The MX269010A performs a measurement of an input signal using the resource of RF Input. Thus, the MX269010A cannot be executed together with another application which uses the same resource, including the signal analyzer function. In order to execute a function unique to the MX269010A via remote control, it is necessary to select the MX269010A while it is executed. In addition, the MX269010A can be used together with another application such as a Vector Signal Generator option which separately uses the resources which the MX269010A does not use.

1.1.3 Restrictions (differences from other applications)

In several ways, how to use the remote control functions of the MX269010A differs from that of other applications. The following functional restrictions apply to the MX269010A.

(1) Status Byte Register and Extended Event Status Register

The MX269010A does not have an Extended Event Status Register (ESE2/ESR2?/ESE3/ESR3?) defined by an application. If the measurement has completed normally, bit 2 of the Status Byte Register always becomes Enable, and if there is an error in the measurement, bit 3 has always become Enable.

(2) Specifying the window status when an application is selected

It is impossible to specify `INACT` (non-active status) for the window status when an application is selected by a `SYS` command.

(3) Error display methods in command or execution error

The MX269010A always displays the message corresponding to the last error when a command error or execution error occurs. When the next command is received or the MX269010A changes into Local Control, the error message will be deleted.

(4) Common command `SVPRM`, `RCPRM`

When the common commands `SVPRM`/`RCPRM` are sent, only the executed and selected statuses are saved or recalled for the MX269010A. If a parameter unique to the MX269010A is saved or recalled, the commands `SAVE` and `RECALL` can be used.

(5) Measurement start command

The MX269010A has only two commands for starting measurement: `SNGLS` and `CONTS`.

(6) Language mode

Remote control for the MX269010A is possible only when commands are transmitted in Native mode. Transmitting a command unique to the MX269010A results in an error. Be sure to transmit the `SYST:LANG NAT` command when starting control of the MX269010A.

1.2 Basics of Remote Control

This section describes a flow to operate the MX269010A, using the remote control and basic methods to transmit commands.

1.2.1 Activating and selecting MX269010A

First, make the MX269010A the operation target of the remote control. This can be omitted if the MX269010A is already selected.

When operating the MX269010A, which is the operation target, via remote control, it must be activated and selected in the same manner as during panel operation.

Activation of an application is performed on the Configuration screen. Check that the MX269010A has been loaded, and then select it.

■ Example program:

Activation and selection of MX269010A

```
1: SYS CONFIG          ; Selects the Configuration screen
2: LOAD WIMAX          ; Loads the MX269010A
3: *OPC?              ; Waits for processing completion
> 1
4: SYS WIMAX           ; Selects the MX269010A
5: *OPC?              ; Waits for processing completion
> 1
```

1.2.2 Setting measurement mode and parameter

Next, set the measurement conditions.

First, initialize the MX269010A to reset all the parameters to the initial values. From the initial status at this time, set only parameters need to be modified.

Next, set the parameters common to downlink and uplink, such as those for setting frequency, level, and CH. Bandwidth.

After the common parameters are completely configured, set a measurement mode depending on whether the measurement target signal (input signal) is a downlink or uplink signal. If the measurement target is a downlink signal, select the Downlink measurement screen, and if it is an uplink signal, select the Uplink measurement screen.

Lastly, set the parameters unique to the measurement mode and each screen, such as those for setting DIUC, UIUC, and “Uplink Parameters”. Be sure to configure the settings according to the properties of the input signal to be measured.

After all the settings are completed, wait for the completion of processing.

■ Example program:

Setting parameters common to downlink and uplink

```
1: PRE ; Initializes parameters
2: FREQ 2345 ; Sets the center frequency of carrier
signals
3: LVLOFS 1.00 ; Sets the level offset (cable loss)
4: INPUTLVL -15.0 ; Sets an input level
5: CHBW 10 ; Sets CH. Bandwidth to 10 MHz
```

■ Example program:

Configuring fundamental settings for downlink signal measurement

```
1: MEAS MOD ; Selects the DL Modulation screen
2: DIUC 1,3 ; Sets DIUC
3: *OPC? ; Waits for processing completion
> 1
```

■ Example of program:

Configuring fundamental settings for uplink signal measurement

- 1: MEAS ULMOD ; Selects the UL Modulation screen
 - 2: UIUC 1,3 ; Sets UIUC
 - 3: ULMODTYPE 1 ; Sets the modulation type
 - 4: ULZONEOFS 3 ; Sets the zone offset
 - 5: ULNUMSYMBOL 18 ; Sets the number of symbols
 - 6: ULFRAMESYNC MANUAL ; Sets the frame number synchronization method
 - 7: ULFRAME 0 ; Sets the frame number
 - 8: ULPERMBASE 0 ; Sets UL PermBase
 - 9: DLIDCLL 0 ; Sets DL IDCell
 - 10: DURATION 60 ; Sets the duration
 - 11: ULSUBCHOFS 3 ; Sets the subchannel offset
 - 12: *OPC? ; Waits for processing completion
- > 1

1.2.3 Starting measurement and detecting end of measurement

After all the settings required for measurement complete, start the measurement.

There are two types of the measurement start commands, `SNGLS` and `CONTS`. When reading the measurement result after one measurement, use `SNGLS`.

After transmitting the measurement start command, execute the process to detect the end of the measurement. Even if the measurement result is read before the end of measurement, the response is not correct.

The methods to detect the end of measurement include the method to use a service request, the method to transmit a query repeatedly until the status changes, and the method to use a processing completion wait status command or query. The measurement time differs according to the measurement conditions. Therefore, if a processing completion wait status command or query is used, time-out of remote control communication may occur. Also, if a query is transmitted repeatedly, it may put too much burden on the processing.

When measurement is ended, check whether the measurement has been completed properly. If a measurement error or overflow has occurred, check the conditions of the setting parameters and input signals, and the physical paths of measurement.

(1) Method to use a service request

A service request can be used by enabling bit 2 (measurement completion) or bit 3 (measurement error) of the Service Request Enable Register, or enabling bit 1 (OPC) of the Standard Event Status Enable Register.

■ Example program:

Waiting for bit 2 or bit 3 of Status Byte Register

```
1: *CLS           ; Clears the statuses
2: *SRE 12        ; Sets to generate a service request when bit
                  ; 2 or 3 of the Status Byte Register is enabled
3: SNGLS          ; Starts the measurement
4: SRQWAIT( )    ; Waits for a service request (the method
                  ; differs according to the environment of the
                  ; remote control application)
5: MERROR?       ; Queries the measurement error occurrence
                  ; status
6: OVF?          ; Queries the overflow occurrence status
```

- Example program:

Wait of the Standard Event Status for OPC bit

```

1: *CLS           ; Clears the statuses
2: *ESE 1         Sets to generate a service request when bit
                  1 of the Standard Event Status Register is
                  enabled
3: *SRE 32        ; Sets to generate a service request when bit
                  5 (ESB) of the Status Byte Register is
                  enabled
4: SNGLS          ; Starts the measurement
5: *OPC           ; Waits for processing completion
6: SRQWAIT ( )   ; Waits for a service request (the method
                  differs according to the environment of the
                  remote control application)
7: MERROR?       ; Queries the measurement error occurrence
                  status
8: OVF?          ; Queries the overflow occurrence status.

```

- (2) Method to monitor the measurement status by transmitting a query repeatedly.

The end of measurement can be detected by querying the values of the Status Byte Register and the Standard Event Status Register directly, or by monitoring the “PAUSE” status defined by the MX269010A. Transmit the query repeatedly until the measurement end status is returned.

- Example program:

Monitoring PAUSE status

```

1: SNGLS          ; Starts the measurement
2: PAUSE?        ; Queries the PAUSE status (repeatedly)
> 0              During measurement
3: PAUSE?        ; Queries the PAUSE status (repeatedly)
> 1              PAUSE status
                  (end of measurement)
4: MERROR?       ; Queries the measurement error occurrence
                  status
5: OVF?          ; Queries the overflow occurrence status

```

(3) Method to use measurement end wait command/query.

■ Example program:

Using *WAI command

- 1: SNGLS ; Starts the measurement
- 2: *WAI ; Processes the next command after the measurement ends.
- 3: MERROR? ; Queries the measurement error occurrence status
- 4: OVF? ; Queries the overflow occurrence status

■ Example program:

Using *OPC? query

- 1: SNGLS ; Starts the measurement
- 2: *OPC? ; Waits for processing completion
- > 1
- 3: MERROR? ; Queries the measurement error occurrence status
- 4: OVF? ; Queries the overflow occurrence status

1.2.4 Reading measurement result

Read the measurement result after checking that the end of the measurement has been detected and no measurement error has occurred. The response of the result is valid only for the measurement mode in which the measurement was performed.

- Example program:

Reading downlink measurement result.

```

1: DLDECODEFAIL?      ; Queries the Decode-Fail occurrence
2: PREAMBLEPWR?      ; Reads the preamble power
3: AVGPWR?           ; Reads the DL average power
4: EVM_TTLRMS? DB    ; Reads the total EVM (rms)
5: SYMBOL 3          ; Sets Symbol 3
6: EVM_SYMBOL? DB    ; Reads Symbol EVM of Symbol 3
7: ZONEINDX 1        ; Sets Zone 1
8: EVM_ZONE? DB      ; Reads EVM of Zone 1

```

- Example program:

Reading uplink measurement result

```

1: AVGPWR?           ; Reads the channel power
2: SYMBOL 3          ; Sets Symbol 3
3: EVM_SYMBOL? DB    ; Reads Symbol EVM of Symbol 3
4: EVM_BURST? DB     ; Reads the burst EVM
5: ULMODSUBCARRERR? DB ; Reads Unmod subcarrier error

```

1.3 Example Programs

This section provides examples of measurement programs from the status in which the MX269010A is already selected.

(1) Example of downlink signal measurement

An example of a program to measure the downlink signal defined in Table 1.3-1 is shown below.

Table 1.3-1 Parameters of example downlink signal

Parameter	Value
Center Frequency	2.500 GHz
Channel Bandwidth	10 MHz (FFT Size = 1024)
Input Level	-10 dBm
Burst Composition	As shown in Figure. 1.3-1 Preamble + FCH + DL-MAP +UL-MAP (QPSK [CTC] 1/2 – DIUC 0) +Burst4 (16QAM [CTC] 1/2 – DIUC 1) +Burst5 (16QAM [CTC] 1/2 – DIUC 1) +Burst6 (16QAM [CTC] 1/2 – DIUC 1) +Burst7 (16QAM [CTC] 1/2 – DIUC 1)

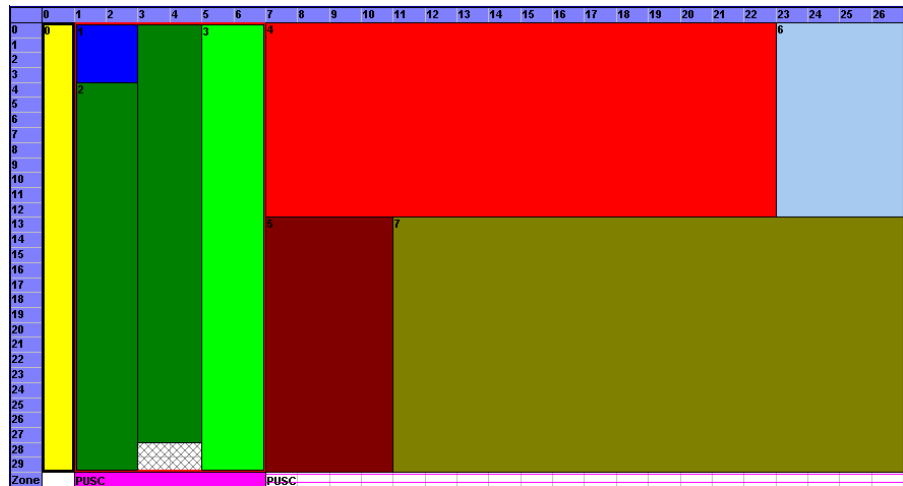


Figure. 1.3-1 Burst configuration of example downlink signal

- Example program:
 - 1: PRE ; Executes initialization
 - 2: MEAS MOD ; Selects the Downlink measurement screen.
 - 3: CHBW 10 ; Sets CH. Bandwidth
 - 4: FREQ 2500 ; Sets the center frequency
 - 5: INPUTLVL -10.0 ; Sets the input level
 - 6: DIUC 1,2 ; Sets DIUC
 - 7: *SRE 44 ; Sets the service request wait bit(s).
 - 8: *CLS ; Clears the statuses
 - 9: SNGLS ; Starts the measurement
 - 10: SRQWAIT() ; Waits for measurement end service request
 - 11: MERROR? ; Queries the measurement error
 - 12: OVF? ; Queries the overflow
 - 13: DLDECODEFAIL? ; Queries the Decode-Fail occurrence
 - 14: AVGPWR? ; Reads the DL average power
 - 15: EVM_PREAMBLE? PER ; Reads the preamble EVM
 - 16: SYMBOL 0 ; Sets Symbol 0
(necessary to read Pilot EVM)
 - 17: EVM_PILOT? PER ; Reads the pilot EVM
 - 18: SYMBOL 7 ; Sets Symbol 7
 - 19: EVM_SYMBOL? PER ; Reads EVM of Symbol 7
 - 20: MEAS MAP ; Selects the DL Map Info. screen
 - 21: BURSTINDX 4 ; Sets Burst Index 4
 - 22: EVM_BURST? PER ; Reads EVM of Burst 4
 - 23: BURST? SYMBOFS ; Reads MAP of Burst 4
 - 24: BURST? SUBCHOFS
 - 25: BURST? SYMBINT
 - 26: BURST? SUBCHINT
 - 27: BURSTINDX 5 ; Selects Burst Index 5
 - 28: EVM_BURST? PER ; Reads EVM of Burst 5
 - 29: BURST? SYMBOFS ; Reads MAP of Burst 5
 - 30: BURST? SUBCHOFS
 - 31: BURST? SYMBINT
 - 32: BURST? SUBCHINT
 - 33: MEAS EVS ; Selects the Error Vector Spectrum screen.

- 34: SUBCARRINDX 100 ; Sets the Subcarrier Index to 100.
- 35: MKR_EVM? ; Reads EVM of Subcarrier Index 100.
- 36: MEAS FLAT ; Selects the Spectral Flatness screen.
- 37: FLATNESS? 0 ; Reads the spectral flatness
- 38: FLATNESS? 1
- 39: FLATNESS? 2
- 40: FLATNESS? 3
- 41: EVM_TTLRMS? DB ; Reads the total EVM (rms)
- 42: EVM_TTLPEAK? DB ; Reads the total EVM (peak)

(2) Example of uplink signal measurement

An example of a program to measure the uplink signal defined in Table 1.3-2 is shown below.

Table 1.3-2 Parameters of example uplink signal

Parameter	Value
Center Frequency	2.500 GHz
Channel Bandwidth	10 MHz (FFT Size = 1024)
Input Level	-10 dBm
Frame Number	0 (fixed)
PermBase	0
ID Cell	0
Burst Composition	Symbols 0 to 2: Initial/Handover Ranging + Fast-Feedback Measurement target burst: Zone offset = 3* Symbol length (Num of Symbols) = 18 Subchannel Offset = 10 slots Burst length (Duration) = 140 slots UL PermBase = 0 Modulation type = 16 QAM (CTC) 3/4 Burst type = Normal

*: When the measurement target burst is in the first uplink zone and the information for controlling Initial/Handover Ranging and Fast-Feedback is included, generate a measurement signal so that the control information channel occupies the first three symbols. Also, set the zone offset to 3 in this event.

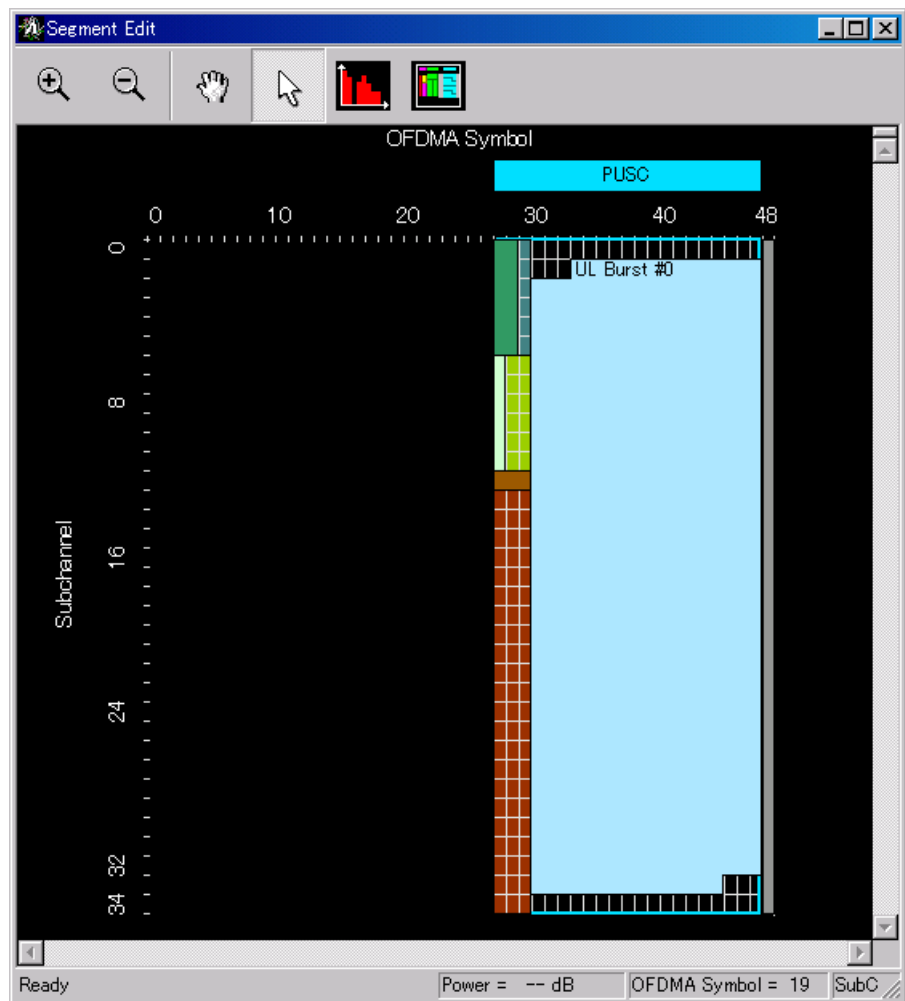


Figure 1.3-2 Uplink signal example (IQ producer screen)

- Example program:
 - 1: PRE ; Executes initialization
 - 2: MEAS ULMOD ; Selects the UL Downlink measurement screen.
 - 3: CHBW 10 ; Sets CH. Bandwidth
 - 4: FREQ 2500 ; Sets the center frequency
 - 5: INPUTLVL -10.0 ; Sets the input level
 - 6: ULMODTYPE 4 ; Sets the modulation type
 - 7: ULFRAMEMODE FIXED ; Sets the fame mode
 - 8: ULFRAME 0 ; Sets the frame number
 - 9: ULZONEOFS 3 ; Sets the zone offset
 - 10: ULNUMSYMBOL 18 ; Sets the symbol length of the burst
 - 11: DLIDCELL 0 ; Set the ID cell

12:	ULPERMBASE 0	; Sets UL PermBase
13:	DURATION 140	; Sets the slot length of the analysis target burst
14:	ULSUBCHOF5 10	; Sets the subchannel offset
15:	ULBURSTTYPE NRM	; Sets the burst type
16:	SNGLS;*WAI	; Synchronizes the measurement start and completion
17:	MERROR?	; Queries the measurement error
18:	OVF?	; Queries the overflow
19:	AVGPWR?	; Reads the channel power
20:	CARRFERR?	; Reads the frequency error
21:	EVM_BURST? PER	; Reads the burst EVM
22:	UNMODSUBCARRERR? PER	; Reads the Unmod subcarrier error
23:	MEAS ULFLAT	; Selects the Spectral Flatness screen
24:	FLATNESS? 0	; Reads the spectral flatness
25:	FLATNESS? 1	
26:	FLATNESS? 2	
27:	FLATNESS? 3	

1.4 Trouble Shooting

This section provides explanations for some possible problems in the remote control of the MX269010A and solutions to the problems.

- (1) When the MS2690A/MS2691A/MS2692A or MS2830A cannot be set to the remote control state and cannot transmit commands

Check whether the settings for the interface used are correct, whether the physical path is correct, and whether the cables are properly connected.

- (a) When a GPIB is used

- (i) Whether the GPIB address is correct
- (ii) Whether the address is different from those of the other GPIB instruments

- (b) When an Ethernet is used

- (i) Whether the IP address is correct
- (ii) Whether the types (cross/straight) of the cable used are correct

- (2) When a command error occurs

Other applications might be selected. Check whether the MX269010A is selected.

- (3) When an execution error occurs

The grammar of the transmitted command or query may be wrong, or the application may not be in the status in which the command or query can be used. Check the definition of the command and the status of the application.

In principle, the downlink measurement result can be read when the Downlink measurement screen is selected, and the uplink measurement result can be read when the Uplink measurement screen is selected.

(4) When the expected measurement result cannot be obtained

The end of measurement may not be detected properly, or the settings for the input signals and the command transmission order may not be correct. Also, for some queries, note that the items of the results to be read may differ according to the screen presently selected and the parameters.

(a) AVGPWR?

The DL average power value is returned when the Downlink measurement screen is selected, and the channel power value is returned when the Uplink measurement screen is selected.

(b) MKR_CONST?

The result for the setting value of Subcarrier Index on the selected screen is returned.

Chapter 2 Device Message List

This chapter describes remote control commands for operating the MX269010A, using a list organized by functions. Refer to Chapter 3 “Device Message Details” for detailed specifications for each command, except for those provided in Chapter 2.1 “IEEE488.2 Common Device Messages.” Refer to the “MS2690A/MS2691A/MS2692A and MS2830A Signal Analyzer Operation Manual (Mainframe Remote Control)” for detailed specifications for the commands in Chapter 2.1 “IEEE488.2 Common Device Messages.”

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2.1 IEEE488.2 Common Device Messages

IEEE488.2 common device messages available in the MX269010A are shown in Table 2.1-1.

Table 2.1-1 IEEE488.2 common device messages

Function	Command	Query	Response	Remarks
Identification	---	*IDN?	ANRITSU,model,serial ,version	model: Main unit model name serial: Main unit serial number version: Software package version
Operation Complete	*OPC	*OPC?	1	
Preset (All Applications)	*RST	---	---	
Self Test	---	*TST?	result	result: Self test result = 0 1
Wait to Continue	*WAI	---	---	
Clear Status	*CLS	---	---	
Service Request Enable Register	*SRE byte	*SRE?	byte	byte = bit7: EESB7 bit6: Not used bit5: ESB bit4: MAV bit3: Mobile WiMAX Error bit2: Mobile WiMAX End bit1: EESB1 bit0: EESB0

Table 2.1-1 IEEE488.2 common device messages (Cont'd)

Function	Command	Query	Response	Remarks
Status Byte Register	---	*STB?	byte	byte = bit7: EESB7 bit6: MSS/RQS bit5: ESB bit4: MAV bit3: Mobile WiMAX Error bit2: Mobile WiMAX End bit1: EESB1 bit0: EESB0
Standard Event Status Enable Register	*ESE byte	*ESE?	byte	byte = bit7: Power on bit6: User request bit5: Command error bit4: Execution error bit3: Device error bit2: Query error bit1: Not used bit0: Operation complete
Standard Event Status Register	---	*ESR?	byte	

2.2 Application Common Device Messages

Application common device messages available in the MX269010A are shown in Table 2.2-1.

Table 2.2-1 Application common device messages

Function	Command	Query	Response	Remarks
Application Switch	SYS WIMAX,window	SYS? WIMAX	status,window	Window: = ACT MIN NON INACT ACT and MIN can be specified by the command. window: Window status status: Application execution status status = CURRENT IDLE RUN UNLOAD
System Restart	REBOOT	---	---	
Preset (Active Application only)	PRE	---	---	
	INI	---	---	
LCD Power	DISPLAY on_off	DISPLAY?	on_off	
Save Parameter	SVPRM file,device	---	---	file: File name device: Drive name = A B D E F ... In the MX269010A, only the states of start and selection are saved
Recall Parameter	RCPRM file,device,apl	---	---	file: File name device: Drive name = A B D E F ... apl: Target application = ALL CURR This parameter can be omitted.

Table 2.2-1 Application common device messages (Cont'd)

Function	Command	Query	Response	Remarks
Hard Copy	PRINT file,device	---	---	file: Filename device: Drive name = A B D E F ...
	PRINT	---	---	
Hard Copy Mode	PMOD format	PMOD?	format	format: Specifies file format = BMP PNG
	PMOD	PMOD?	BMP	
Calibration	CAL mode	---	---	mode: Calibration mode = ALL LEVEL LOLEAK SUPPRESS BAND Asynchronous command
Language Mode	SYST:LANG mode	SYST:LANG?	mode	mode: Language mode = SCPI NAT

2.3 Measurement Screen Selection

Device messages for selecting a measurement screen are shown in Table 2.3-1.

Table 2.3-1 Measurement screen selection messages

Function		Command	Query	Response	Remarks
DL Modulation		MEAS MOD	MEAS?	MOD	
DL I/Q Received		MEAS IQ		IQ	
DL Map Info.		MEAS MAP		MAP	
DL Error Vector Spectrum		MEAS EVS		EVS	
DL Error Vector Time		MEAS EVT		EVT	
DL Spectral Flatness		MEAS FLAT		FLAT	
UL Modulation		MEAS ULMOD		ULMOD	
UL Error Vector Spectrum		MEAS ULEVS		ULEVS	
UL Error Vector Time		MEAS ULEV T		ULEVT	
UL Spectral Flatness		MEAS ULFLAT		ULFLAT	
Spectral Flatness Graph	Absolute	GRAPH_FLATNESS ABS	GRAPH_FLATNESS?	ABS	
	Differential	GRAPH_FLATNESS DIFF		DIFF	
Modulation (Back To Mobile WiMAX)		CONF:EVM	---	---	
ACP (Swept)		CONF:SWEP:ACP	---	---	
ACP (FFT)		CONF:FFT:ACP	---	---	
OBW (Swept)		CONF:SWEP:OBW	---	---	
OBW (FFT)		CONF:FFT:OBW	---	---	
SEM (Swept)		CONF:SWEP:SEM	---	---	

2.4 Parameter Setting

Device messages for setting parameters are shown in Table 2.4-1.

Table 2.4-1 Parameter setting messages

Function	Command	Query	Response	Remarks
Center Frequency	FREQ f	FREQ?	f	
Input Level	INPUTLVL l	INPUTLVL?	l	
Level Offset	LVLOFS l	LVLOFS?	l	
Attenuator +	AT UP	AT?	1	
Attenuator -	AT DN	AT?	1	
Attenuator (numeric value)	AT l	AT?	1	
Pre-Amp (option)	On	PREAMP ON	ON	
	Off	PREAMP OFF	OFF	
CH. Bandwidth	3.5 MHz	CHBW 3.5	3.5	
	5 MHz	CHBW 5	5	
	7 MHz	CHBW 7	7	
	8.75 MHz	CHBW 8.75	8.75	
	10 MHz	CHBW 10	10	
	20 MHz	CHBW 20	20	
DL Map	Auto	MAPDETINFO AUTO	AUTO	
	Import	MAPDETINFO IMPORT	IMPORT	
	Local Edit	MAPDETINFO LOCALEDIT	LOCALEDIT	
DL Map Import	IMPORTDLMAP filename,drive	IMPORTDLMAP?	status,filename	
DL Map Edit – FCH	On	MNLFCH ON	ON	
	Off	MNLFCH OFF	OFF	
DL Map Edit – DL-MAP	Normal	MNLDLMAP ON	ON	
	Off	MNLDLMAP OFF	OFF	
DL Map Edit – Burst	DIUC	MNLBURST DIUC, n	n	
	Symbol Offset	MNLBURST SYMBOFS, n	n	
	Symbol Interval	MNLBURST SYMBINT, n	n	

Function		Command	Query	Response	Remarks
	Sub Channel Offset	MNLBURST SUBCHOFs, n	MNLBURST? SUBCHOFs	n	
	Sub Channel Interval	MNLBURST SUBCHINT, n	MNLBURST? SUBCHINT	n	
	Boosting Index	MNLBURST BOOSTINDX, n	MNLBURST? BOOSTINDX	n	
	Repetition Code	MNLBURST REPETCODE, n	MNLBURST? REPETCODE	n	
Frequency Offset	On	FREQOFS ON	FREQOFS?	ON	
	Off	FREQOFS OFF		OFF	
Channel Estimation	On	CHEST ON	CHEST?	ON	
	Off	CHEST OFF		OFF	
Equalizer	Preamble Only	CHESTEQ PREAMBLE	CHESTEQ?	PREAMBLE	
	Preamble + Data	CHESTEQ DATA		DATA	
	Preamble + Data (Average)	CHESTEQ DATAAVG		DATAAVG	
CH. Tracking – Amplitude	On	CHESTAMP ON	CHESTAMP?	ON	
	Off	CHESTAMP OFF		OFF	
CH. Tracking – Phase	On	CHESTPHASE ON	CHESTPHASE?	ON	
	Off	CHESTPHASE OFF		OFF	

Table 2.4-1 Parameter setting messages (Cont'd)

Function		Command	Query	Response	Remarks
Trigger	Free Run	TRIG FREE	TRIG?	FREE	
	External	TRIG EXT		EXT	
	SG (option)	TRIG SG		SG	
Trigger Slope	Rise	TRIGSLOPE RISE	TRIGSLOPE?	RISE	
	Fall	TRIGSLOPE FALL		FALL	
Trigger Delay		TRIGDELAY t	TRIGDELAY?	t	
Search Time		SEARCHTIME t	SEARCHTIME?	t	
DIUC		DIUC diuc, fec	DIUC? diuc	fec	
UIUC		UIUC uiuc, fec	UIUC? uiuc	fec	
Sampling Freq. Offset	On	SAMPFREQOFS ON	SAMPFREQOFS?	ON	
	Off	SAMPFREQOFS OFF		OFF	
Cyclic Prefix	1/4	CP 0	CP?	0	
	1/8	CP 1		1	
	1/16	CP 2		2	
	1/32	CP 3		3	
Antenna (DL)	ANT 0	ANT 0	ANT?	0	
	ANT 1	ANT 1		1	
RF Spectrum	Normal	RFSPECTRUM NORMAL	RFSPECTRUM?	NORMAL	
	Reverse	RFSPECTRUM REVERSE		REVERSE	
Symbol		SYMBOL n	SYMBOL?	n	
Subcarrier Index		SUBCARRINDX n	SUBCARRINDX?	n	
Input Type	Off	INPUTTYPE OFF	INPUTTYPE?	OFF	
	QPSK	INPUTTYPE QPSK		QPSK	
	16QAM	INPUTTYPE 16QAM		16QAM	
	64QAM	INPUTTYPE 64QAM		64QAM	
Marker	On	MKR ON	MKR?	ON	
	Off	MKR OFF		OFF	
DL MAP Info. Display	Zone	MAPINFODISP ZONE	MAPINFODISP?	ZONE	
	Burst	MAPINFODISP BURST		BURST	

Table 2.4-1 Parameter setting messages (Cont'd)

Function	Command	Query	Response	Remarks
Zone Index	ZONEINDX n	ZONEINDX?	n	
Burst Index	BURSTINDX n	BURSTINDX?	n	
Uplink Parameters – Modulation Type	ULMODTYPE uiuc	ULMODTYPE?	uiuc	
Uplink Parameters - Zone Type	PUSC	ULZONETYPE?	PUSC	
	AMC 2x3		AMC23	
Uplink Parameters – Zone Offset	ULZONEOFS n	ULZONEOFS?	n	
Uplink Parameters – Num of Symbols	ULNUMSYMBOL n	ULNUMSYMBOL?	n	
Uplink Parameters – UL PermBase	ULPERMBASE n	ULPERMBASE?	n	
Uplink Parameters – DL IDCell	DLIDCELL n	DLIDCELL?	n	
Uplink Parameters – Duration	DURATION n	DURATION?	n	
Uplink Parameters – Subchannel Offset	ULSUBCHOF n	ULSUBCHOF?	n	
Uplink Parameters – Frame Sync	Auto	ULFRAMESYNC?	AUTO	
	Manual		MANUAL	
Uplink Parameters - Frame Number	ULFRAME n	ULFRAME?	n	
Uplink Parameters – Burst Type	Normal	ULBURSTTYPE?	NRM	
	Collaborative		CLB	
Uplink Parameters – Pilot Pattern	A	ULPILOT?	A	
	B		B	
Save Settings	SAVE n	---	---	
Recall Settings	RECALL n	---	---	

2.5 Performing Measurement and Reading Each State

Device messages for performing measurement and reading each state are shown in Table 2.5-1.

Table 2.5-1 Messages for performing measurement and reading each state

Function		Command	Query	Response	Remarks
Single		SNGLS	---	---	
Continuous		CONTS	---	---	
Parameter Changed	No Change	---	PRMCHANGED?	0	
	Changed	---		1	
Error Status	No Error	---	MERROR?	0	
	Error	---		1	
Pause Status	Measuring	---	PAUSE?	0	
	Pause	---		1	
Overflow Status	Normal	---	OVF?	0	
	Overflow	---		1	
Oven Cold Status	Normal	---	OC?	0	
	Oven Cold	---		1	
Reference Signal	INT, Lock	---	REF?	INT, LOCK	
	INT, Unlock	---		INT, UNLOCK	
	EXT, Lock	---		EXT, LOCK	
	EXT, Unlock	---		EXT, UNLOCK	
FCH or DL Map Decode	Normal	---	DLDECODEFAIL?	0	
	Fail	---		1	

2.6 Reading Downlink Measurement Result

Device messages for reading downlink measurement results are shown in Table 2.6-1. The following commands are available only when the Downlink measurement screen is selected.

Table 2.6-1 Messages for reading downlink measurement results

Function	Command	Query	Response	Remarks
Preamble Power	---	PREAMBLEPWR?	l	
DL Average Power	---	AVGPWR?	l	
CINR	---	CINR?	l	
Frequency Offset	---	CARRFERR?	f	Unit; Hz
	---	CARRFERR_PPM?	f	Unit; ppm
Timing Error	---	TIMINGERR?	t	
Preamble Index	---	PREAMBLEINDX?	n	
Cell ID	---	CELLID?	n	
Segment ID	---	SEGMENT?	n	
Preamble EVM	---	EVM_PREAMBLE? unit	f	
Pilot EVM	---	EVM_PILOT? unit	f	unit= PER DB
Symbol EVM	---	EVM_SYMBOL? unit	f	unit= PER DB
Zone EVM	---	EVM_ZONE? unit	f	unit= PER DB
Burst EVM	---	EVM_BURST? unit	f	unit= PER DB
Total EVM (rms)	---	EVM_TTLRMS? unit	f	unit= PER DB
Total EVM (rms) Preamble Excluded	---	EVM_TTLPERMS? unit	f	unit= PER DB
Total EVM (peak)	---	EVM_TTLPEAK? unit	f	unit= PER DB
Subcarrier Number at Total EVM (peak)	---	SUBCARR_TTLPEAK?	n	
Symbol Number at Total EVM (peak)	---	SYMBOL_TTLPEAK?	n	
FCH	Sub Channel Bitmap	---	FCH? SUBCHBITMAP	n
	Repetition Coding	---	FCH? REPETITION	n
	Coding Indication	---	FCH? CODING	n
	DL Map Length	---	FCH? DLMAPLEN	n

Table 2.6-1 Messages for reading downlink measurement results (Cont'd)

	Function	Command	Query	Response	Remarks
DL Map / Compressed DL-MAP / Compressed UL-MAP	Message Type	---	DLMAP? MSGTYPE	n	
	Base Station ID	---	DLMAP? BSID	n	
	DCD Count	---	DLMAP? DCD	n	
	Frame Number	---	DLMAP? FRMNUM	n	
	Frame Duration	---	DLMAP? FRMDUR	n	
	Symbol Number	---	DLMAP? SYMBNUM	n	
	UL Symbol Number	---	DLMAP? ULSYMBNUM	n	
	Compressed Map Indicator	---	DLMAP? CMAPI	n	
	UL-Map Append	---	DLMAP? ULMAPAP	n	
	Map Message Length	---	DLMAP? MAPMSGLEN	n	
	Operation ID	---	DLMAP? OPID	n	
	Sector ID	---	DLMAP? SECID	n	
	DL IE Count	---	DLMAP? DLIE	n	
	UCD Count	---	DLMAP? UCD	n	
	Allocation Start Time	---	DLMAP? ALLOCST	n	
Map Type	---	DLMAP? MAPTYPE	n		

Table 2.6-1 Messages for reading downlink measurement results (Cont'd)

	Function	Command	Query	Response	Remarks
DL Zone IE	Permutation	---	ZONE? PRMT	mode	
	Symbol Offset	---	ZONE? SYMBOFS	n	
	Symbol Interval	---	ZONE? SYMBINT	n	
	STC / 2/3 antenna select	---	ZONE? STC	n	
	Matrix Indicator	---	ZONE? MATRIX	n	
	DL PermBase	---	ZONE? PERMBASE	n	
	Pilot Subcarrier Power	---	ZONE? PILOTPWR	l	
	Data Subcarrier Power	---	ZONE? DATAPWR	l	
	Null Subcarrier Power	---	ZONE? NULLPWR	l	
	Punctured Pilot Power	---	ZONE? PUNCTUREDPILOTPWR	l	
	AMC Type	---	ZONE? AMCTYPE	n	
UL Map and DL Map IE	DIUC	---	BURST? DIUC	n	
	Boosting	---	BURST? BOOSTINDX	n	
	Symbol Offset	---	BURST? SYMBOFS	n	
	Sub Channel Offset	---	BURST? SUBCHOF S	n	
	Symbol Interval	---	BURST? SYMBINT	n	
	Sub Channel Interval	---	BURST? SUBCHINT	n	
	Repetition Code	---	BURST? REPETCODE	n	
	Matrix Indicator	---	BURST? MATRIX	n	
	Num_Layers	---	BURST? NUMLAYERS	n	
	UL Map - UCD Count	---	BURST? UCDCNT	n	
	UL Map - Allocation Start Time	---	BURST? STARTTIME	n	
	UL Map - Symbol Number	---	BURST? SYMBNUM	n	

Table 2.6-1 Messages for reading downlink measurement results (Cont'd)

Function		Command	Query	Response	Remarks
Number of DL zones		---	NUMDLZONE?	n	
Number of DL bursts		---	NUMDLBURST?	n	
Number of DL symbols		---	NUMDLSYMBOL?	n	
Spectral Flatness	-N _{used} /2 to -N _{used} /4	---	FLATNESS? 0	l _{max} , sub _{max} , l _{min} , sub _{min}	
	-N _{used} /4 to -1	---	FLATNESS? 1		
	+1 to N _{used} /4	---	FLATNESS? 2		
	N _{used} /4 to N _{used} /2	---	FLATNESS? 3		
Max Absolute Difference		---	MAXDIFF?	l, sub1, sub2	
IQ DC Offset		---	IQDCOFS?	l	
Avg power per subcarrier		---	AVGPWRPERSC?	l	
Marker	Power Spectrum	---	MKR_SPECT?	l	
	Constellation	---	MKR_CONST?	l _i , l _q	
	EVM	---	MKR_EVM?	f	
	Spectral Flatness (Absolute)	---	MKR_FLATNESS?	l	
	Spectral Flatness (Differential)	---	MKR_DIFFFLAT?	l	

2.7 Reading Uplink Measurement Result

Device messages for reading uplink measurement results are shown in Table 2.7-1. The following commands are available only when the Uplink measurement screen is selected.

Table 2.7-1 Messages for reading uplink measurement results (Cont'd)

Function	Command	Query	Response	Remarks
Frequency Offset	---	CARRFERR?	f	Unit; Hz
	---	CARRFERR_PPM?	f	Unit; ppm
Symbol EVM	---	EVM_SYMBOL? unit	evm	unit= PER DB
Burst EVM	---	EVM_BURST? unit	evm	unit= PER DB
Unmodulated Subcarrier Error	---	UNMODSUBCARRERR? unit	r	unit= PER DB
Channel Power	---	AVGPWR?	l	
Marker – Power Spectrum	---	MKR_SPECT?	l	
Marker – Constellation	---	MKR_CONST?	l_i, l_q	
Marker – EVM	---	MKR_EVM?	f	
Marker – Spectral Flatness (Absolute)	---	MKR_FLATNESS?	l	
Marker – Spectral Flatness (Differential)	---	MKR_DIFFFLAT?	l	
Timing Error	---	TIMINGERR?	t	
Spectral Flatness	-N _{used} /2 to -N _{used} /4	---	FLATNESS? 0	l_max, sub_max, l_min, sum_min
	-N _{used} /4 to -1	---	FLATNESS? 1	
	+1 to N _{used} /4	---	FLATNESS? 2	
	N _{used} /4 to N _{used} /2	---	FLATNESS? 3	
Max Absolute Difference	---	MAXDIFF?	l, sub1, sub2	
IQ DC Offset	---	IQDCOFS?	l	
Avg power per subcarrier	---	AVGPWRPERSC?	l	
Pilot Subcarrier Power	---	ULPILOTPWR?	l	
Data Subcarrier Power	---	ULDATA PWR?	l	
Null Subcarrier Power	---	ULNULLPWR?	l	

Table 2.7-1 Messages for reading uplink measurement results

Function	Command	Query	Response	Remarks
Null Subcarrier Power	---	ULNULLPWR?	1	

Chapter 3 Device Message Details

This chapter describes detailed specifications on remote control commands for executing functions of the MX269010A in alphabetical order. Refer to the “MS2690A/MS2691A/MS2692A and MS2830A Signal Analyzer Operation Manual (Mainframe Remote Control)” for detailed specifications of IEEE488.2 common device messages and application common device messages.

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EVM_SYMBOL?	3-38
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MKR_FLATNESS?	3-62
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ANT/ANT?

Antenna (DL)

Function

This command sets the antenna for measuring downlink signals.

Command

ANT mode

Query

ANT?

Response

mode

Parameter

mode	Antenna
0	Antenna 0 (ANT0)
1	Antenna 1 (ANT1)

Example of Use

```
To select Antenna 1:  
1: ANT 1  
2: ANT?  
> 1
```

AT/AT?

Attenuator

Function

This command sets the attenuator. The query command queries the current setting value.

Command

AT action

AT 1

Query

AT?

Response

1

Parameter

action	Attenuator
UP	+2 dB
DN	-2 dB

1	Attenuator
Resolution	2 dB
Unit	dB

Example of Use

To set the attenuator by 2 dB:
AT UP

AVGPWR?

DL Average Power/Channel Power

Function

This command queries the average power (DL Average Power) between downlink intervals when the Downlink measurement screen is selected. This command queries the average power (Channel Power) between the specified uplink intervals when the Uplink measurement screen is selected.

Query

AVGPWR?

Response

1

Parameter

1	DL average power (DL mode) Channel power (UL mode)
Resolution	0.01
Unit	dBm

Example of Use

To query the DL average power:
AVGPWR?

AVGPWRPERSC?

Average Power per subcarrier

Function

This command queries the reference power for the spectral line during spectral flatness measurement. During downlink measurement, the average power per subcarrier within the downlink period excluding the preamble is obtained. During uplink measurement, the channel power per subcarrier is obtained.

Command

None

Query

AVGPWRPERSC?

Response

1

Parameter

1	Avg power per subcarrier
Resolution	0.01
Unit	dBm

Example of Use

To query the Avg power per subcarrier result.
AVGPWRPERSC?

BURST?

UL Map & DL Map IE for Current Burst Index

Function

This command queries the measurement result of DL Map IE of the currently set Burst Index and the analysis result of UL MAP. An execution error occurs if this command is executed when the Downlink measurement screen is not selected, or when the set Burst Index is 2 or less.

Query

BURST? item

Response

result

Parameter

item Result inquiry item
 result Measurement result

item	Types of results	result
DIUC	DIUC	Range: 0 to 12, Resolution: 1
SYMBOFS	Symbol Offset	Decimal, Resolution: 1
SUBCHOFBS	Sub Channel Offset	Decimal, Resolution: 1
BOOSTINDX	Boosting Index	Decimal, Resolution: 1
SYMBINT	Symbol Interval	Decimal, Resolution: 1
SUBCHINT	Sub Channel Interval	Decimal, Resolution: 1
REPETCODE	Repetition Code	0: No Repetition 1: 2 Repetitions 2: 4 Repetitions 3: 6 Repetitions
MATRIX	Matrix Indicator*	0 : Matrix A 1 : Matrix B 2 : Others
NUMLAYERS	Num_Layers*	Decimal, Resolution: 1
UCDCNT	UL Map - UCD Count	Decimal, Resolution: 1
STARTTIME	UL Map - Allocation Start Time	Hexadecimal, Resolution: 1
SYMBNUM	UL Map - Symbol Number	Decimal, Resolution: 1

*Note: For bursts that are not in an STC zone, "-999.0" is returned.

Example of Use

To query DIUC of Burst Index 4:

1: BURSTINDX 4

2: BURST? DIUC

BURSTINDX/BURSTINDX?

Burst Index

Function

This command sets the Burst Index, which is a parameter displayed on the DL Map Info. Screen. This command is available only on the DL Map Info. screen.

Command

BURSTINDX n

Query

BURSTINDX?

Response

n

Parameter

n	Burst Index
Range	0 to the number of the detected bursts – 1
Resolution	1

Example of Use

```
To set the Burst Index to 1:  
1: BURSTINDX 1  
2: BURSTINDX?  
> 1
```

CAL

Calibration

Function

This command executes calibration.

Command

CAL mode

Parameter

mode	Calibration type
ALL	Executes all the calibrations.
LEVEL	Executes level calibration.
LOLEAK_SUPPRESS	Executes local leak suppress.
BAND	Executes in-band calibration.

Example of Use

To execute all calibrations:
CAL ALL

CARRFERR?

Freq Offset (Hz)

Function

This command queries the measurement result of the frequency offset to the input signal.

The downlink measurement result is returned when the Downlink measurement screen is selected, and uplink measurement result is returned when the Uplink measurement screen is selected.

Query

CARRFERR?

Response

f

Parameter

f	Frequency offset
Resolution	0.1
Unit	Hz

Example of Use

To query the frequency offset:
CARRFERR?

CARRFERR_PPM?

Freq Offset (ppm)

Function

This command queries the measurement result of the frequency offset to the input signal in ppm. The downlink measurement result is returned when the Downlink measurement screen is selected, and uplink measurement result is returned when the Uplink measurement screen is selected.

Query

CARRFERR_PPM?

Response

f

Parameters

f	Frequency offset (ppm)
Resolution	0.001
Unit	ppm

Example of Use

To query the measurement result of the frequency offset to the input signal in ppm.

CARRFERR_PPM?

CELLID?

Cell ID

Function

This command queries the Cell ID analysis result of the downlink signal. An execution error occurs if this command is executed when the Downlink measurement screen is not selected.

Query

CELLID?

Response

n

Parameter

n	Cell ID
Resolution	1

Example of Use

To query the Cell ID:
CELLID?

CHBW/CHBW?

CH. Bandwidth

Function

This command sets the CH. Bandwidth.

Command

```
CHBW f
```

Query

```
CHBW?
```

Response

```
f
```

Parameter

f	CH. Bandwidth
3.5	3.5 MHz
5	5 MHz
7	7 MHz
8.75	8.75 MHz
10	10 MHz
20	20 MHz

Example of Use

To set the CH. Bandwidth to 5 MHz:

```
1: CHBW 5
2: CHBW?
> 5
```

CHEST/CHEST?

Channel Estimation

Function

This command enables (On) or disables (Off) channel estimation.

Command

```
CHEST on_off
```

Query

```
CHEST?
```

Response

```
on_off
```

Parameter

on_off	Channel estimation
ON	On
OFF	Off

Example of Use

To enable channel estimation:

```
1: CHEST ON
2: CHEST?
> ON
```

CHESTAMP/CHESTAMP?

CH. Tracking – Amplitude

Function

This command sets the CH tracking amplitude function to On/Off. An execution error occurs if this command is executed when channel estimation is disabled (Off).

Command

CHESTAMP on_off

Query

CHESTAMP?

Response

on_off

Parameter

on_off	CH tracking amplitude – On/Off
ON	On
OFF	Off

Example of Use

To set the CH. tracking amplitude function of channel estimation to On:

```
1: CHEST ON
2: CHESTAMP ON
3: CHESTAMP?
> ON
```

CHESTEQ/CHESTEQ?

Channel Estimation – Equalizer

Function

This command sets the equalizer. An execution error occurs if this command is executed when channel estimation is disabled (Off).

Command

CHESTEQ mode

Query

CHESTEQ?

Response

mode

Parameter

mode	Channel estimation – Equalizer
PREAMBLE	Preamble only
DATA	Preamble + Data
DATAAVG	Preamble + Data (Average)

Example of Use

To set the equalizer of channel estimation to Preamble only:

```
1: CHEST ON
2: CHESTEQ PREAMBLE
3: CHESTEQ?
> PREAMBLE
```

CHESTPHASE/CHESTPHASE?

CH. Tracking – Phase

Function

This command sets the CH tracking phase function to On/Off. An execution error occurs if this command is executed when channel estimation is disabled (Off).

Command

CHESTPHASE on_off

Query

CHESTPHASE?

Response

on_off

Parameter

on_off	CH tracking phase – On/Off
ON	On
OFF	Off

Example of Use

To set the CH. tracking phase function of channel estimation to On:

```
1: CHEST ON
2: CHESTPHASE ON
3: CHESTPHASE?
> ON
```

CINR?

CINR

Function

This command queries CINR of the downlink signal. An execution error occurs if this command is executed when the Downlink measurement screen is not selected.

Query

CINR?

Response

cinr

Parameter

f	CINR
Resolution	0.01
Unit	dB

Example of Use

To query CINR:
CINR?

CONF:EVM

Modulation (Back To Mobile WiMAX)

Function

This command switches the current function from a measurement function of Signal Analyzer or Spectrum Analyzer to the modulation function of the Mobile WiMAX. An execution error occurs if this command is executed when the modulation function is already selected.

Command

CONF:EVM

Query

None

Response

None

Parameter

None

Example of Use

To switch from the ACP measurement function of Signal Analyzer to the modulation function.

CONF:EVM

CONF:FFT:ACP

Signal Analyzer - ACP

Function

This command selects the ACP measurement function of Signal Analyzer.

For the Mobile WiMAX, this command is available if CH. Bandwidth is set to 5 MH or 10 MHz.

Command

CONF:FFT:ACP

Query

None

Response

None

Parameter

None

Example of Use

To select the ACP measurement function of Signal Analyzer.

CONF:FFT:ACP

CONF:FFT:OBW

Signal Analyzer - OBW

Function

This command selects the OBW measurement function of Signal Analyzer.

For the Mobile WiMAX, this command is available if CH. Bandwidth is set to 5 MH or 10 MHz.

Command

CONF:FFT:OBW

Query

None

Response

None

Parameter

None

Example of Use

To select the OBW measurement function of Signal Analyzer.

CONF:FFT:OBW

CONF:SWEP:ACP

Spectrum Analyzer - ACP

Function

This command selects the ACP measurement function of Spectrum Analyzer.

For the Mobile WiMAX, this command is available if CH. Bandwidth is set to 5 MH or 10 MHz.

Command

CONF:SWEP:ACP

Query

None

Response

None

Parameter

None

Example of Use

To select the ACP measurement function of Spectrum Analyzer.

CONF:SWEP:ACP

CONF:SWEF:OBW

Spectrum Analyzer - OBW

Function

This command selects the OBW measurement function of Spectrum Analyzer.

For the Mobile WiMAX, this command is available if CH. Bandwidth is set to 5 MHz or 10 MHz.

Command

CONF:SWEF:OBW

Query

None

Response

None

Parameter

None

Example of Use

To select the OBW measurement function of Spectrum Analyzer.

CONF:SWEF:OBW

CONF:SWEP:SEM

Spectrum Analyzer - SEM

Function

This command selects the SEM (Spectrum Emission Mask) measurement function of Spectrum Analyzer.

For the Mobile WiMAX, this command is available if CH. Bandwidth is set to 5 MHz or 10 MHz.

Command

CONF:SWEP:SEM

Query

None

Response

None

Parameter

None

Example of Use

To select the SEM measurement function of Spectrum Analyzer.

CONF:SWEP:SEM

CONTS

Continuous Measurement

Function

This command starts measurement in the continuous mode. An execution error occurs if this command is executed when DIUC List and UIUC List are displayed.

If the `CONTS` command is transmitted, Bit 0 (OPC) of the Standard Event Status Register becomes “enable” at the time the command processing completes in the MX269010A, that is to say, at the time the measurement starts. Similarly, if `*WAI` is transmitted right after the `CONTS` command has been transmitted, the next command is processed at the time the measurement starts.

After the measurement starts, bit 2 of the Status Byte Register becomes “enable” every time a measurement finishes normally.

Bit 3 of the Status Byte Register becomes “enable” when a measurement error occurs.

The `PAUSE` flag is always 0 during measurement started by the `CONTS` command.

Command

`CONTS`

Example of Use

To start measurement in the continuous mode:

`CONTS`

CP/CP?

Cyclic Prefix

Function

This command sets the cyclic prefix.

Command

CP mode

Query

CP?

Response

mode

Parameter

mode	Cyclic prefix (CP)
0	1/4
1	1/8
2	1/16
3	1/32

Example of Use

To set the cyclic prefix to 1/8:

1: CP 1

2: CP?

> 1

DISPLAY/DISPLAY?

LCD Power

Function

This command sets the backlight of the LCD to On/Off.

Command

```
DISPLAY on_off
```

Query

```
DISPLAY?
```

Response

```
on_off
```

Parameter

on_off	Status of the backlight of the LCD
ON	On
OFF	Off

Example of Use

To set the backlight of LCD to Off:
DISPLAY OFF

DIUC/DIUC?

DIUC

Function

This command sets the FEC code for DIUC.

Command

```
DIUC diuc, fec
```

Query

```
DIUC? diuc
```

Response

```
fec
```

Parameter

diuc	DIUC
Range	0 to 12
Resolution	1
fec	FEC code
0	QPSK * CTC * 1/2
1	QPSK * CTC * 3/4
2	16QAM * CTC * 1/2
3	16QAM * CTC * 3/4
4	64QAM * CTC * 1/2
5	64QAM * CTC * 2/3
6	64QAM * CTC * 3/4
7	64QAM * CTC * 5/6
8	QPSK * CC * 1/2
9	QPSK * CC * 3/4
10	16QAM * CC * 1/2
11	16QAM * CC * 3/4
12	64QAM * CC * 1/2
13	64QAM * CC * 2/3
14	64QAM * CC * 3/4

Example of Use

```
To set the FEC code 64QAM * CTC * 5/6 for DIUC 1:  
1: DIUC 1,7  
2: DIUC? 1  
> 7
```


DLDECODEFAIL?

FCH or DL Map Decode Fail

Function

This command queries whether decoding of FCH or DL-MAP failed. An execution error occurs if this command is executed when the Downlink measurement screen is not selected.

Query

DLDECODEFAIL?

Response

n

Parameter

n	FCH or DL Map Decode
0	Decoding success
1	Decoding failure

Example of Use

To query whether decoding of FCH or DL-MAP succeeded or failed:
DLDECODEFAIL?

DLIDCELL/DLIDCELL?

DL IDCell

Function

This command sets the DL ID cell, which is one of the Uplink Parameters. This parameter is necessary for setting an uplink signal.

Command

DLIDCELL n

Query

DLIDCELL?

Response

n

Parameter

n	DL ID cell
Range	0 to 31
Resolution	1

Example of Use

To set the DL ID cell to 0:
1: DLIDCELL 0
2: DLIDCELL?
> 0

DLMAP?

DL Map

Function

This command queries the analysis result of DL MAP. An execution error occurs if this command is executed when the Downlink measurement screen is not selected.

Query

DLMAP? item

Response

result

Parameter

item Result inquiry item
 result Measurement result

item	Types of results	result
MSGTYPE	Message Type	Range: 0 to 12, Resolution: 1
BSID	Base Station ID	Hexadecimal, Resolution: 1
DCD	DCD Count	Decimal, Resolution: 1
FRMNUM	Frame Number	Hexadecimal, Resolution: 1
FRMDUR	Frame Duration	Unit: ms
SYMBNUM	Symbol Number	Decimal, Resolution: 1
ULSYMBNUM	UL Symbol Number	Decimal, Resolution: 1
CMAPI	Compressed Map	Decimal, Resolution: 1
ULMAPAP	UL-MAP Append	Decimal, Resolution: 1
MAPMSGLEN	Map Message Length	Decimal, Resolution: 1
OPID	Operator ID	Decimal, Resolution: 1
SECID	Sector ID	Decimal, Resolution: 1
DLIE	DL IE Count	Decimal, Resolution: 1
UCD	UCD Count	Decimal, Resolution: 1
ALLOCST	Allocation Start Time	Decimal, Resolution: 1
MAPTYPE	Map Type	DLMAP : DL-MAP COMPDLMAP : Compressed-DL-MAP COMPDLULMAP : Compressed DL-MAP/UL-MAP

Example of Use

To query the DCD count result of DL MAP:
 DLMAP? DCD

DURATION/DURATION?

Duration

Function

This command sets the width of the uplink measuring object in slot units. This parameter must be set when measuring an uplink signal.

Command

DURATION n

Query

DURATION?

Response

n

Parameter

n	Duration
Range	1 to (Num of Symbols – 3)/3 × Number of sub-channels
Resolution	1

Example of Use

To set the duration of uplink signal to 17:
1: DURATION 17
2: DURATION?
> 17

EVM_BURST?

EVM for Burst

Function

When the Downlink measurement screen is selected, this command queries the measurement result of EVM for the burst set in Burst Index. When Burst Index is 0, the same value as the Preamble EVM is returned.

When the Uplink measurement screen is selected, this command queries the measurement result of EVM for the measurement target burst.

Query

```
EVM_BURST? unit
```

Response

```
evm
```

Parameter

unit	Reading unit
PER	%
DB	dB
evm	EVM
Resolution	0.01
Unit	Unit specified in unit

Example of Use

To query the EVM for Burst Index 4:

```
1: BURSTINDX 4
2: EVM_BURST? PER
```

EVM_PILOT?

Pilot EVM

Function

This command queries the measurement result of Pilot EVM during downlink measurement. An execution error occurs if this command is executed when the Downlink measurement screen is not selected.

Query

```
EVM_PILOT? unit
```

Response

```
evm
```

Parameter

unit	Reading unit
PER	%
DB	dB

evm	Pilot EVM
Resolution	0.01
Unit	Unit specified in unit

Example of Use

To query the Pilot EVM:

```
1: SYMBOL 0  
2: EVM_PILOT? PER
```

EVM_PREAMBLE?

Preamble EVM

Function

This command queries the measurement result of Preamble EVM during downlink measurement. An execution error occurs if this command is executed when the Downlink measurement screen is not selected.

Query

```
EVM_PREAMBLE? unit
```

Response

```
evm
```

Parameter

unit	Reading unit
PER	%
DB	dB
evm	Preamble EVM
Resolution	0.01
Unit	Unit specified in unit

Example of Use

To query the Preamble EVM:
EVM_PREAMBLE? PER

EVM_SYMBOL?

Symbol EVM

Function

This command queries the measurement result of Symbol EVM during downlink measurement when the Downlink measurement screen is selected, and queries the measurement result of Symbol EVM during uplink measurement when the Uplink measurement screen is selected. An execution error occurs if this command is executed when Symbol is set to 0 in the Downlink measurement screen.

Query

```
EVM_SYMBOL? unit
```

Response

```
evm
```

Parameter

unit	Reading unit
PER	%
DB	dB
evm	Symbol EVM
Resolution	0.01
Unit	Unit specified in unit

Example of Use

To query the Symbol EVM:

```
1: SYMBOL 1  
2: EVM_SYMBOL? PER
```


EVM_TTLPEAK?

Total EVM (peak)

Function

This command queries the peak EVM in the downlink segment.

Query

```
EVM_TTLPEAK? unit
```

Response

```
evm
```

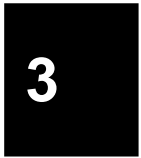
Parameter

unit	Reading unit
PER	%
DB	dB

evm	EVM
Resolution	0.01
Unit	Unit specified in unit

Example of Use

To query Total EVM (peak):
 EVM_TTLPEAK? PER



EVM_TTLPERMS?

Total EVM (rms) Preamble Excluded

Function

This command queries the average EVM in the downlink segment excluding the preamble part.

Query

```
EVM_TTLPERMS? unit
```

Response

```
evm
```

Parameter

unit	Reading unit
PER	%
DB	dB

evm	EVM
Resolution	0.01
Unit	Unit specified in unit

Example of Use

To query Total EVM (rms) Preamble Excluded:
EVM_TTLPERMS? PER

EVM_ZONE?

EVM for Zone

Function

This command queries the measured EVM for the zone set in Zone Index.

Query

```
EVM_ZONE? unit
```

Response

```
evm
```

Parameter

unit	Reading unit
PER	%
DB	dB
evm	EVM
Resolution	0.01
Unit	Unit specified in unit

Example of Use

To query the measured EVM for Zone Index 1:

```
1: ZONEINDX 1
2: EVM_ZONE? PER
```

FCH?

FCH

Function

This command queries the analysis result of FCH. An execution error occurs if this command is executed when the Downlink measurement screen is not selected.

Query

FCH? item

Response

result

Parameter

item Result inquiry item
 result Measurement result

item	Types of results	result
SUBCHBITMAP	Sub Channel Bitmap	Decimal, Resolution: 1
REPETITION	Repetition Coding	0: No Repetition 1: 2 Repetition 2: 4 Repetition 3: 6 Repetition
CODING	Coding Indication	0: CC 1: BTC 2: CTC 3: ZT CC 4: CC with interleaver 5: LDPC
DLMAPLEN	DL Map Length	Decimal, Resolution: 1

Example of Use

To query the coding indication in FCH:
 FCH? CODING

FLATNESS?

Spectral Flatness

Function

This command queries the maximum level between spectral lines and the sub-carrier index.

Query

```
FLATNESS? unit
```

Response

```
l_max, subcarr_max, l_min, subcarr_min
```

Parameter

unit	Reading unit
0	$N_{used}/2$ to $-N_{used}/4$
1	$N_{used}/4$ to -1
2	$+1$ to $N_{used}/4$
3	$N_{used}/4$ to $N_{used}/2$
l_max	Maximum level between spectral lines
l_min	Minimum level between spectral lines
Resolution	0.01
Unit	dBc
subcarr_max	Sub-carrier index for the maximum level
subcarr_min	Sub-carrier index for the minimum level
Resolution	1

Example of Use

To query the spectral flatness for $N_{used}/2$ to $-N_{used}/4$:
FLATNESS? 0

FREQ/FREQ?

Center Frequency

Function

This command sets the center frequency of the measurement signal in MHz units.

Command

FREQ f

Query

FREQ?

Response

f

Parameter

f	Center frequency
Range	50 to the Upper limit of the main unit
Resolution	0.000001 MHz
Unit	MHz
Suffix	HZ, KHZ, KZ, MHZ, MZ, GHZ, GZ MHZ is set when omitted.

Example of Use

To set the center frequency to 2.345 GHz:

```
1: FREQ 2345
2: FREQ?
> 2345.000000
```

FREQOFS/FREQOFS?

Frequency Offset

Function

This command sets the frequency offset function to On/Off.

Command

```
FREQOFS on_off
```

Query

```
FREQOFS?
```

Response

```
on_off
```

Parameter

on_off	Frequency offset – On/Off
ON	On
OFF	Off

Example of Use

To enable the frequency offset (On):

```
1: FREQOFS ON
2: FREQOFS?
> ON
```

GRAPH_FLATNESS/GRAPH_FLATNESS?

Graph type in Spectral Flatness

Function

This command sets the graph type to be displayed in the Spectral Flatness screen.

Command

```
GRAPH_FLATNESS type
```

Query

```
GRAPH_FLATNESS?
```

Response

```
type
```

Parameter

type	Graph type in Spectral Flatness screen
ABS	Absolute Flatness
DIFF	Differential Flatness

Example of Use

To display the Absolute Flatness graph:

```
1: GRAPH_FLATNESS ABS
```

```
2: GRAPH_FLATNESS?
```

```
> ABS
```


IMPORTDLMAP/ IMPORTDLMAP?

DL Map Import

Function

This command imports the parameter file that includes DL Map information generated with Mobile WiMAX IQproducer.

Command

```
IMPORTDLMAP filename,drive
```

Query

```
IMPORTDLMAP?
```

Response

```
status,filename
```

Parameter

drive	Drive name (D to Z)
filename	File name to import/file name being imported (character string including .xml) Character string within 32 characters enclosed by double quotation marks (" ") or single quotation marks (' ') (excluding extension) The following characters cannot be used: \ / : * ? " " ' ' < >
status	Import status
0	File is not imported.
1	File is imported.

Example of Use

To import the file "TEST.xml" in drive D.

```
1: IMPORTDLMAP 'TEST.xml',D
2: IMPORTDLMAP?
> 1,TEST
```

INI

Preset

Function

This command initializes the present settings and statuses. This command functions the same as the PRE command.

Command

INI

Example of Use

To executes an initialization:

INI

INPUTLVL/INPUTLVL?

Input Level

Function

This command sets the input level of the measurement signal.

Command

INPUTLVL 1

Query

INPUTLVL?

Response

1

Parameter

1	Input level
Range	-120.00 + level offset to 34.00 + level offset
Resolution	0.01
Unit	dBm
Suffix	DBM
	DBM is set even when omitted.

Example of Use

To set the input level to -10.00 dBm:

```

1: INPUTLVL -10.00
2: INPUTLVL?
> -10.00
    
```

INPUTTYPE/INPUTTYPE?

Input Type

Function

This command sets the input type for the currently selected DL/UL mode, and cannot be used on the DL Map Info. screen.

Command

```
INPUTTYPE type
```

Query

```
INPUTTYPE?
```

Response

```
type
```

Parameter

type	Input Type
OFF	Off
QPSK	QPSK
16QAM	16QAM
64QAM	64QAM

Example of Use

To set the input type to QPSK:

```
1: INPUTTYPE QPSK
2: INPUTTYPE?
> QPSK
```

IQDCOFS?

IQ DC Offset

Function

This command queries the measurement result of the IQ DC offset.

Query

IQDCOFS?

Response

1

Parameter

1	IQ DC offset
Resolution	0.01
Unit	dB

Example of Use

To query the IQ DC offset:
IQDCOFS?



LVLOFS/LVLOFS?

Level Offset

Function

This command sets the offset for the input signal level.

Command

```
LVLOFS 1
```

Query

```
LVLOFS?
```

Response

```
1
```

Parameter

1	Level offset
Range	-100.00 to 100.00
Resolution	0.01
Unit	dB
Suffix	DB

DB is set even when omitted.

Example of Use

To set the level offset to -10.00 dB:

```
1: LVLOFS -10.00
```

```
2: LVLOFS?
```

```
> -10.00
```

MAPDETINFO/MAPDETINFO?

DL Map

Function

Sets the method for processing DL Map information during downlink measurement.

Command

```
MAPDETINFO mode
```

Query

```
MAPDETINFO?
```

Response

```
mode
```

Parameter

mode	DL Map
AUTO	Auto (automatic detection)
IMPORT	Import (applies the settings in the imported parameter file)
LOCALEDIT	Local Edit (applies the settings on the DL MAP Local Edit screen)

Example of Use

To perform measurement based on the settings in the imported parameter file.

```
1: MAPDETINFO IMPORT
2: MAPDETINFO?
> IMPORT
```

MAPINFODISP/MAPINFODISP?

DL Map Info. - Display

Function

This command sets the type of information to be displayed in the lower part of the DL Map Info. screen.

Command

MAPINFODISP mode

Query

MAPINFODISP?

Response

mode

Parameter

mode	Display
ZONE	Zone Displays the result for the zone set in Zone Index.
BURST	Burst Displays the result for the burst set in Burst Index.

Example of Use

To display in the lower part of the DL Map Info. screen the result for the burst:

```
1: MAPINFODISP BURST
2: MAPINFODISP?
> BURST
```


MAXDIFF?

Max Absolute Difference

Function

This command queries the maximum level difference between the adjacent subcarriers and the subcarrier index.

Query

MAXDIFF?

Response

1, subcarr1, subcarr2

Parameter

1	Maximum level difference between the adjacent subcarriers
Resolution	0.01
Unit	dB
subcarr1	Adjacent subcarrier index 1
subcarr2	Adjacent subcarrier index 2
Resolution	1

Example of Use

To query the maximum level difference between the adjacent subcarriers:
MAXDIFF?

MEAS/MEAS?

Measurement Screen

Function

This command selects the measurement screen.

Command

MEAS mode

Query

MEAS?

Response

mode

Parameter

mode	Measurement screen
MOD	DL Modulation
IQ	DL I/Q Received
MAP	DL Map Info.
EVS	DL Error Vector Spectrum
EVT	DL Error Vector Time
FLAT	DL Spectral Flatness
ULMOD	UL Modulation
ULEVS	UL Error Vector Spectrum
ULEVT	UL Error Vector Time
ULFLAT	UL Spectral Flatness

Example of Use

To select the DL Map Info. screen:

MEAS MAP

MERROR?

Measurement Error

Function

This command returns a flag that indicates occurrence of a measurement error.

The effectiveness of the flag means that the displayed measurement result is not correct.

Query

```
MERROR?
```

Response

```
error
```

Parameter

<code>error</code>	Measurement error
<code>0</code>	No error
<code>1</code>	Error

Example of Use

To query the error status:
MERROR?

MKR/MKR?

Marker

Function

This command sets the marker display On/Off. An execution error occurs if this command is executed when the I/Q Received or DL Map Info screen is selected.

Command

MKR on_off

Query

MKR?

Response

on_off

Parameter

on_off	Marker
ON	Display
OFF	Not display

Example of Use

To enable marker display on the Modulation screen:

```
1: MEAS MOD
2: MKR ON
3: MKR?
> ON
```

MKR_CONST?

Constellation

Function

This command queries the result of the marker on the Constellation graph for the currently selected screen. The result can be read even if marker display is disabled.

When the Downlink measurement screen is selected, the result for downlink is returned. When the Uplink measurement screen is selected, the result for uplink is returned.

Query

```
MKR_CONST?
```

Response

```
i,q
```

Parameter

i	Phase I data
q	Phase Q data
Resolution	0.000001

Example of Use

To query the result of IQ data for Symbol 7 and Subcarrier Index 123:

```
1: MEAS IQ
2: SYMBOL 7
3: SUBCARRINDX 123
4: MKR_CONST?
```

MKR_DIFFFLAT?

Differential Flatness for Marker

Function

This command queries the result of the marker on the Differential graph for the Spectral Flatness screen. The result can be read even if marker display is disabled. When the Downlink measurement screen is selected, the result for downlink is returned. When the Uplink measurement screen is selected, the result for uplink is returned.

Query

MKR_DIFFFLAT?

Response

1

Parameter

1	Difference of average power between subcarrier N currently selected and subcarrier N+1
Resolution	0.01
Unit	dB

Example of Use

To query the result of the marker on the Differential graph:

```
1: MEAS FLAT
2: GRAPH_FLATNESS DIFF
3: SUBCARRINDX 123
4: MKR_DIFFFLAT?
```

MKR_EVM?

EVM for Marker

Function

This command queries the result of the marker on the Error Vector Spectrum and Error Vector Time graphs. The result can be read even if marker display is disabled.

An execution error occurs if this command is executed when neither the Error Vector Spectrum nor Error Vector Time measurement screen is selected, or if Symbol is 0.

DC is returned if Subcarrier Index is 0.

The downlink measurement results are returned if the Downlink measurement screen is selected, and the uplink measurement results are returned if the Uplink measurement screen is selected.

Query

```
MKR_EVM?
```

Response

```
evm
```

Parameter

evm	EVM
Resolution	0.01
Unit	%

Example of Use

To query EVM for Symbol 7 and Subcarrier Index 123 on the Error Vector Spectrum screen:

```
1: MEAS EVS
2: SYMBOL 7
3: SUBCARRINDX 123
4: MKR_EVM?
```

MKR_FLATNESS?

Absolute Flatness for Marker

Function

This command queries the result of the marker on the Absolute graph in the Spectral Flatness screen. The result can be read even if marker display is disabled. When the Downlink measurement screen is selected, the result for downlink is returned. When the Uplink measurement screen is selected, the result for uplink is returned.

Query

MKR_FLATNESS?

Response

1

Parameter

1	Average power of Subcarrier
Resolution	0.01
Unit	dB

Example of Use

To query the average power of Subcarrier Index 123:
1: MEAS FLAT
2: SUBCARRINDX 123
3: MKR_FLATNESS?

MKR_SPECT?

Power Spectrum for Marker

Function

This command queries the result of the marker on the Power Spectrum graph. The result can be read even if marker display is disabled. The result for downlink is returned when the Downlink measurement screen is selected, and the result for uplink is returned when the Uplink measurement screen is selected.

Query

```
MKR_SPECT?
```

Response

```
1
```

Parameter

1	Power at marker
Resolution	0.01
Unit	dB

Example of Use

To query the average power of Subcarrier Index 123:

```
1: MEAS MOD
2: SUBCARRINDX 123
3: MKR_SPECT?
```

MNLBURST/ MNLBURST?

DL Map Edit – Burst

Function

Sets the burst attribute on the DL Map Edit screen.

Command

MNLBURST item,value

Query

MNLBURST? item

Response

value

Parameter

item Burst attribute (setting target)
value Settings

Burst attribute corresponding to item and setting range for value

item	Burst attribute	value
DIUC	DIUC	0 to 12
SYMBOFS	Symbol Offset	1, 3
SYMBINT	Symbol Interval	2 to (Maximum value determined by the Cyclic Prefix and Channel Bandwidth settings) Resolution: 2
SUBCHOFS	Subchannel Offset	1 to (Maximum value determined by the Symbol Offset, FCH, DL-MAP, and FFT Size settings)
SUBCHINT	Subchannel Interval	1 to (Maximum value determined by the Symbol Offset, FCH, DL-MAP, and FFT Size settings) Resolution: No Repetition = 1 2 Repetitions = 2 4 Repetitions = 4 6 Repetitions = 6

**Burst attribute corresponding to item and setting range for value
(cont'd)**

Item	Burst attribute	Value
BOOSTINDX	Boost Index	0 : 0 dB 1 : +6 dB 2 : -6 dB 3 : +9 dB 4 : +3 dB 5 : -3 dB 6 : -9 dB 7 : -12 dB
REPETCODE	Repetition Code	0 : No Repetition 1 : 2 Repetitions 2 : 4 Repetitions 3 : 6 Repetitions

Example of Use

To set DIUC as the burst attribute on the DL Map Edit screen.

```
1: MNLBURST DIUC,0
2: MNLBURST? DIUC
> 0
```

MNLDLMAP/ MNLDLMAP?

DL Map Edit – DL-Map

Function

Sets DL-MAP on the DL Map Edit screen.

Command

MNLDLMAP mode

Query

MNLDLMAP?

Response

mode

Parameter

mode	DL Map Edit – DL-MAP
ON	With DL-MAP.
OFF	Without DL-MAP.

Example of Use

To enable DL-MAP on the DL Map Edit screen.

1: MNLDLMAP ON

2: MNLDLMAP?

> ON

MNLFCH/ MNLFCH?

DL Map Edit – FCH

Function

Sets FCH on the DL Map Edit screen.

Command

MNLFCH mode

Query

MNLFCH?

Response

mode

Parameter

mode	DL Map Edit – FCH
ON	With FCH.
OFF	Without FCH.

Example of Use

To enable FCH on the DL Map Edit screen.

```
1: MNLFCH ON
2: MNLFCH?
> ON
```

NUMDLBURST?

Number of DL bursts

Function

This command queries the number of bursts of the downlink signal. An execution error occurs if this command is executed when the Downlink measurement screen is not selected.

Query

NUMDLBURST?

Response

n

Parameter

n	Number of the detected bursts
Resolution	1

Example of Use

To query the number of the detected bursts:
NUMDLBURST?

NUMDLSYMBOL?

Number of DL symbols

Function

This command queries the number of symbols of the downlink signal. An execution error occurs if this command is executed when the Downlink measurement screen is not selected.

Query

NUMDLSYMBOL?

Response

n

Parameter

n	Number of the detected symbols
Resolution	1

Example of Use

To query the number of the detected symbols:
NUMDLSYMBOL?

NUMDLZONE?

Number of DL zone

Function

This command queries the number of zones of the downlink signal. An execution error occurs if this command is executed when the Downlink measurement screen is not selected.

Query

NUMDLZONE?

Response

n

Parameter

n	Number of the detected zones
Resolution	1

Example of Use

To query the number of the detected zones:
NUMDLZONE?

OC?

Oven Cold

Function

This command returns a flag that indicates the Oven Cold state.

Query

OC?

Response

oc

Parameter

oc	Oven Cold
0	Normal
1	Oven Cold

Example of Use

To query the Oven Cold state:
OC?

OVF?

Overflow

Function

This command returns a flag that indicates overflow occurrence.

Query

OVF?

Response

ovf

Parameter

ovf	Overflow
0	Normal
1	Overflow

Example of Use

To query the overflow state:

OVF?

PAUSE?

Pause

Function

This command returns a flag that indicates the current measurement status. If a flag is valid, it means that the measurement has paused.

Query

PAUSE?

Response

pause

Parameter

pause	Pause status
0	Measuring
1	Pause

Example of Use

To query whether the measurement has paused:
PAUSE?

PMOD/PMOD?

Hard Copy Mode

Function

This command sets a file format for saving a screen image.

Command

PMOD format

Query

PMOD?

Response

format

Parameter

format	File format
BMP	BMP format
PNG	PNG format

Example of Use

To save a screen image in PNG format:

1: PMOD PNG

2: PRINT

PRE

Preset

Function

This command initializes the current settings and conditions. This command functions the same as the `INI` command.

Command

```
PRE
```

Example of Use

To execute an initialization:

```
PRE
```

PREAMBLEINDX?

Preamble Index

Function

This command queries the result of Preamble Index of the downlink signal. An execution error occurs if this command is executed when the Downlink measurement screen is not selected.

Query

PREAMBLEINDX?

Response

n

Parameter

n Preamble Index
Resolution 1

Example of Use

To query the Preamble Index:
PREAMBLEINDX?

PREAMBLEPWR?

Preamble Power

Function

This command queries the result of Preamble Power. An execution error occurs if this command is executed when the Downlink measurement screen is not selected.

Query

PREAMBLEPWR?

Response

1

Parameter

1	Preamble Power
Resolution	0.01
Unit	dBm

Example of Use

To query the Preamble Power:
PREAMBLEPWR?

PREAMP/PREAMP?

Pre-Amplifier

Function

This command sets the optional pre-amplifier on/off. A command error occurs if the Option 008 is not installed.

Command

```
PREAMP on_off
```

Query

```
PREAMP?
```

Response

```
on_off
```

Parameter

on_off	Pre-amplifier
ON	On
OFF	Off

Example of Use

To enable the pre-amplifier:

```
1: PREAMP ON
2: PREAMP?
> ON
```


PRINT

Hard Copy

Function

This command saves a screen image into a file. This command can specify the file name of the file to be saved and the name of the saving destination device.

Command

```
PRINT file,device
```

Parameter

file	<p>Target file name</p> <p>Character string within 32 characters enclosed by double quotation marks (" ") or single quotation marks (' ') (excluding extension)</p> <p>The following characters cannot be used:</p> <pre style="margin-left: 40px;">\ / : * ? " " \ ' < > </pre> <p>Named automatically when omitted.</p>
device	<p>Drive name</p> <pre style="margin-left: 40px;">A, B, D, E, F, ...</pre> <p>Set to drive D when omitted.</p>

Details

The numbers added to a file name are from 00 to 999. The number after 999 returns to 00, so it is overwritten if there is a file which has the same name.

Example of Use

To save a screen image into a file with the file name "TEST" in an internal hard disk:

```
PRINT "TEST",D
```

PRMCHANGED?

Parameter Changed

Function

This command displays a flag that indicates a parameter change. If the flag is valid, it means that the displayed or returned measurement result is the one before the change.

Query

PRMCHANGED?

Response

changed

Parameter

changed	Parameter change
0	No change
1	Changed

Example of Use

To query the parameter change flag:
PRMCHANGED?

RCPRM

Recall Parameter Setting file

Function

This command recalls the contents of a parameter setting file and applies them to the settings and conditions of the applications other than the MX269010A. For the MX269010A, only the contents related to execution and selection are recalled. Use the `RECALL` command to recall the parameters for the MX269010A.

Command

```
RCPRM file,device,apl
```

Parameter

<code>file</code>	Target file name Character string within 32 characters enclosed by double quotation marks (" ") or single quotation marks (' ') (excluding extension) The following characters cannot be used: \ / : * ? " " \ ' < >
<code>device</code>	Drive name A, B, D, E, F, ...
<code>apl</code>	Target application
ALL	All applications
When omitted	All applications

Example of Use

To recall the parameter settings in the "TEST" file saved in an internal hard disk to apply them to the settings of all the applications other than those of the MX269010A:

```
RCPRM "TEST",D,ALL
```

REBOOT

System Restart

Function

This command restarts the system. When this command is received, communication via remote control is impossible until all the applications have been completely restarted.

Command

REBOOT

Example of Use

To restart the system:

REBOOT

RECALL

Recall

Function

This command recalls the saved parameter settings.

Command

```
RECALL n
```

Parameter

n	Save pattern number
Range	1 to 7
Resolution	1

Example of Use

To recall the settings of the save pattern number 1:
RECALL 1

REF?

Reference Signal

Function

This command queries the current reference clock state.

Query

```
REF?
```

Response

```
root,status
```

Parameter

root	Reference clock used
INT	Internal
EXT	External
status	Lock state
LOCK	Normal
UNLOCK	Unlock

Example of Use

To query the current reference clock state:
REF?

RFSPECTRUM/RFSPECTRUM?

RF Spectrum

Function

This command sets whether to reverse the spectrum (I/Q phases) of the input signal to be measured.

Command

RFSPECTRUM mode

Query

RFSPECTRUM?

Response

mode

Parameter

mode	Phase
NORMAL	Normal
REVERSE	Reverse

Example of Use

To measure input signals with the IQ phases reversed.

```
1: RFSPECTRUM REVERSE
2: RFSPECTRUM?
> REVERSE
```

SAMPFREQOFS/SAMPFREQOFS?

Sampling Frequency Offset

Function

This command sets whether to correct the sampling frequency error.

Command

```
SAMPFREQOFS on_off
```

Query

```
SAMPFREQOFS?
```

Response

```
on_off
```

Parameter

on_off	Sampling frequency offset
ON	On
OFF	Off

Example of Use

To enable the sampling frequency offset:

```
1: SAMPFREQOFS ON
2: SAMPFREQOFS?
> ON
```


SAVE

Save

Function

This command saves the current parameter settings.

Command

```
SAVE n
```

Parameter

n	Save pattern number
Range	1 to 7
Resolution	1

Example of Use

To save the current settings as the save pattern number 1:
SAVE 1

SEARCHTIME/SEARCHTIME?

Search Time

Function

This command sets the maximum search time for trigger measurement.

Command

SEARCHTIME t

Query

SEARCHTIME?

Response

t

Parameter

t	Search Time
Range	100 to 5000
Resolution	1
Unit	Micro seconds
Suffix	NS, US, MS, S
	US is set when omitted.

Example of Use

To set Search Time to 200 micro seconds:

```
1: TRIG EXT
2: SEARCHTIME 200
3: SEARCHTIME?
> 200
```

SEGMENT?

Segment ID

Function

This command queries the result of Segment ID of the downlink signal. An execution error occurs if this command is executed when the Downlink measurement screen is not selected.

Query

SEGMENT?

Response

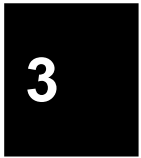
n

Parameter

n Segment ID
Resolution 1

Example of Use

To query the Segment ID:
SEGMENT?



SNGLS

Single Measurement

Function

This command starts measurement in the single mode. An execution error occurs if this command is executed when DIUC List and UIUC List are displayed.

Refer to Section 1.2.3 “Starting measurement and detecting end of measurement” for how to wait for the completion of the measurement start.

Command

SNGLS

Example of Use

To start measurement in the single mode:

SNGLS

SUBCARR_TTLPEAK?

Subcarrier number at Total EVM (peak)

Function

This command queries the subcarrier number at the peak EVM.

Query

```
SUBCARR_TTLPEAK?
```

Response

```
n
```

Parameter

```
n          Subcarrier number
Resolution  1
```

Example of Use

```
To query the subcarrier number at the peak EVM:
SUBCARR_TTLPEAK?
> 289
```

SUBCARRINDX/SUBCARRINDX?

Subcarrier Index

Function

This command sets Subcarrier Index for the currently selected screen, and cannot be used when the DL Map Info. screen is selected.

Command

SUBCARRINDX n

Query

SUBCARRINDX?

Response

n

Parameter

n Subcarrier Index

FFT Size	Screen Name	Range	
1024	DL Modulation DL I/Q Received UL Modulation	-512 to +511	
	DL Error Vector Spectrum DL Error Vector Time DL Spectral Flatness UL Error Vector Spectrum UL Error Vector Time UL Spectral Flatness	PUSC -420 to -1, 1 to +420 FUSC -425 to -1, 1 to +425 AMC (2x3) -432 to -1, 1 to +432	
	512	DL Modulation DL I/Q Received UL Modulation	-256 to +255
		DL Error Vector Spectrum DL Error Vector Time DL Spectral Flatness UL Error Vector Spectrum UL Error Vector Time UL Spectral Flatness	PUSC -204 to -1, 1 to +204 FUSC -213 to -1, 1 to +213 AMC (2x3) -216 to -1, 1 to +216

FFT Size	Screen Name	Range
2048	DL Modulation	-1024 to +1023
	DL I/Q Received	
	UL Modulation	
	DL Error Vector Spectrum	PUSC
	DL Error Vector Time	-840 to -1, 1 to +840
	DL Spectral Flatness	FUSC
	UL Error Vector Spectrum	-851 to -1, 1 to +851
UL Error Vector Time	AMC (2x3)	
UL Spectral Flatness	-864 to -1, 1 to +864	

Example of Use

To set the Subcarrier Index on the I/Q Received screen to 1:

```
1: MEAS IQ
2: SUBCARRINDX 1
3: SUBCARRINDX?
> 1
```

SVPRM

Save Parameter Setting as file

Function

This command saves the settings and statuses of the applications other than the MX269010A into a parameter setting file. For the MX269010A, only the settings related to execution and selection are saved.

Use the `SAVE` command to save the parameters of the MX269010A.

Command

```
SVPRM file,device
```

Parameter

`file` Target file name
Character string within 32 characters enclosed by double quotation marks (") or single quotation marks (' ') (excluding extension)

The following characters cannot be used:

```
\ / : * ? " ' < > |
```

Named automatically when omitted.

`device` Drive name

A, B, D, E, F, ...

Set to drive D when omitted.

Example of Use

To save the parameter settings into a file with the file name "TEST" in the internal hard disk:

```
SVPRM "TEST",D
```


SYMBOL/SYMBOL?

Symbol

Function

This command sets the number of the symbol to display for the currently selected DL/UL mode.

Command

SYMBOL n

Query

SYMBOL?

Response

n

Parameter

n	Symbol
Range	DL: 0 to (Number of the detected symbols – 1) UL: 0 to (Setting value of Num of Symbols – 1)
Resolution	1

Example of Use

To set Symbol to 1 on the DL Modulation screen:

```
1: MEAS MOD
2: SYMBOL 1
3: SYMBOL?
> 1
```

SYMBOL_TTLPEAK?

Symbol number at Total EVM (peak)

Function

This command queries the symbol number at the peak EVM.

Query

```
SYMBOL_TTLPEAK?
```

Response

```
n
```

Parameter

n	Symbol number
Resolution	1

Example of Use

To query the symbol number at the peak EVM:

```
SYMBOL_TTLPEAK?
```

```
> 13
```

SYS/SYS?

Application Switch

Function

This command selects the MX269010A.

Command

SYS WIMAX,window

Query

SYS? WIMAX

Response

status,window

Parameter

window	Application window status
ACT	Manipulable (Displayed in the foreground)
INACT	Not manipulable (Only query)
MIN	Minimized (Only query)
NON	A window is not displayed (Only query)
When omitted	Same as ACT
status	Application status
CURRENT	Executed and selected as the operation object
RUN	Executed but not selected as the operation object
IDLE	Loaded but not executed
UNLOAD	Not loaded

Example of Use

To switch the operation object to the MX269010A:

1: SYS WIMAX,ACT

2: SYS? WIMAX

> CURRENT,ACT

SYST:LANG/SYST:LANG?

Language Mode

Function

This command sets the language mode of the remote control commands.
Set to Native mode when using the MX269010A.

Command

SYST:LANG mode

Query

SYST:LANG?

Response

mode

Parameter

mode	Language mode
NAT	Native mode
SCPI	SCPI mode

Example of Use

To set the language mode to Native mode:

```
1: SYST:LANG NAT
```

```
2: SYST:LANG?
```

```
> NAT
```

TIMINGERR?

Timing Error

Function

This command queries the result for timing error measurement in the currently selected DL/UL mode. When Trigger Delay is set to Free Run, -999.00 is returned.

Query

TIMINGERR?

Response

t

Parameter

t	Timing Error
Resolution	0.01
Unit	Micro seconds

Example of Use

To query the result for timing error:
TIMINGERR?

TRIG/TRIG?

Trigger

Function

This command sets the trigger type.

Command

TRIG mode

Query

TRIG?

Response

mode

Parameter

mode	Trigger
FREE	Free run
EXT	External
SG	SG Marker (option)

Example of Use

To set the external input trigger:

```
1: TRIG EXT
```

```
2: TRIG?
```

```
> EXT
```

TRIGDELAY/TRIGDELAY?

Trigger Delay

Function

This command sets the trigger delay.

Command

TRIGDELAY t

Query

TRIGDELAY?

Response

t

Parameter

t	Trigger delay
Range	-5000.0 to 5000.0
Resolution	0.1
Unit	Micro seconds
Suffix	NS, US, MS, S
	US is used when omitted.

Example of Use

To set the trigger delay to 5 micro seconds:

```

1: TRIG EXT
2: TRIGDELAY 5.0
3: TRIGDELAY?
> 5.0

```

TRIGSLOPE/TRIGSLOPE?

Trigger Slope

Function

This command sets the effective trigger slope (edge).

Command

```
TRIGSLOPE mode
```

Query

```
TRIGSLOPE?
```

Response

```
mode
```

Parameter

mode	Trigger slope
RISE	Rise
FALL	Fall

Example of Use

To set the rising edge of the trigger signal as the trigger:

```
1: TRIG EXT
2: TRIGSLOPE RISE
3: TRIGSLOPE?
> RISE
```


UIUC/UIUC?

UIUC

Function

This command sets the FEC code to UIUC.

Command

```
UIUC uiuc, fec
```

Query

```
UIUC? uiuc
```

Response

```
fec
```

Parameter

uiuc	UIUC
Range	1 to 4
Resolution	1
fec	FEC code
0	QPSK * CTC * 1/2
1	QPSK * CTC * 3/4
2	16QAM * CTC * 1/2
3	16QAM * CTC * 3/4
4	64QAM * CTC * 1/2
5	64QAM * CTC * 2/3
6	64QAM * CTC * 3/4
7	64QAM * CTC * 5/6

Example of Use

```
To set the FEC code QPSK * CTC * 1/2 to UIUC 1:
1: UIUC 1,0
2: UIUC? 1
> 0
```

ULBURSTTYPE/ULBURSTTYPE?

Uplink Parameters - Burst Type

Function

This command sets the burst type of the uplink input signals to Normal burst or Collaborative burst.

Command

```
ULBURSTTYPE mode
```

Query

```
ULBURSTTYPE?
```

Response

```
mode
```

Parameter

mode	Burst type
NRM	Normal
CLB	Collaborative

Example of Use

To set the burst type to Collaborative:

```
1: ULBURSTTYPE CLB
2: ULBURSTTYPE?
> CLB
```

ULDATAPWR?

Uplink Data Subcarrier Power

Function

This command queries the measurement result of Uplink Data Subcarrier Power.

Query

ULDATAPWR?

Response

1

Parameter

1	Data Subcarrier Power
Resolution	0.01
Unit	dBm

Example of Use

To query Uplink Data Subcarrier Power:
 ULDATAPWR?
 > -12.50

ULFRAME/ULFRAME?

Uplink Parameters - Frame Number

Function

This command sets the number of the frame targeted for uplink analysis.

Command

```
ULFRAME n
```

Query

```
ULFRAME?
```

Response

```
n
```

Parameter

n	Frame number
Range	0 to 16,777,215
Resolution	1

Example of Use

```
To set the frame number to 0:  
1: ULFRAME 0  
2: ULFRAME?  
> 0
```

ULFRAMESYNC/ULFRAMESYNC?

Uplink Parameters - Frame Sync

Function

This command sets the synchronization method for the frame numbers of uplink input signals.

Command

ULFRAMESYNC mode

Query

ULFRAMESYNC?

Response

mode

Parameter

mode	Frame Sync
AUTO	Auto
MANUAL	Manual (value set by the Frame Number parameter)

Example of Use

To set Frame Sync to Manual:

```
1: ULFRAMESYNC MANUAL
2: ULFRAMESYNC?
> MANUAL
```

ULMODTYPE/ULMODTYPE?

Uplink Parameters – Modulation Type

Function

This command sets the modulation type of the uplink analysis target burst.

Command

```
ULMODTYPE uiuc
```

Query

```
ULMODTYPE?
```

Response

```
uiuc
```

Parameter

uiuc	UIUC
Range	1 to 8
Resolution	1

Example of Use

To set the modulation type to QPSK*CTC*1/2:

```
1: UIUC 1,0
2: ULMODTYPE 1
3: ULMODTYPE?
> 1
```

ULNULLPWR?

Uplink Null Subcarrier Power

Function

This command queries the measurement result of Uplink Null Subcarrier Power.

Query

ULNULLPWR?

Response

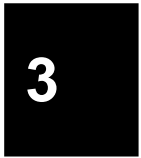
1

Parameter

1	Null Subcarrier Power
Resolution	0.01
Unit	dB

Example of Use

To query Uplink Null Subcarrier Power:
 ULNULLPWR?
 > -45.00



ULNUMSYMBOL/ULNUMSYMBOL?

Uplink Parameters - Num of Symbols

Function

This command sets Num of Symbols, which is one of the Uplink Parameters.

Command

ULNUMSYMBOL n

Query

ULNUMSYMBOL?

Response

n

Parameter

n	Num of Symbols
Range	3 to 21 – Zone Offset (5 MHz, 10 MHz, 20 MHz) 3 to 18 – Zone Offset (8.75 MHz) 3 to 15 – Zone Offset (3.5 MHz, 7 MHz bandwidth)
Resolution	3

Example of Use

To set Num of Symbols to 6:

1: ULNUMSYMBOL 6

2: ULNUMSYMBOL?

> 6

ULPERMBASE/ULPERMBASE?

UL PermBase

Function

This command sets PermBase of the uplink signal to be input.

Command

ULPERMBASE n

Query

ULPERMBASE?

Response

n

Parameter

n	Uplink PermBase
Range	0 to 69
Resolution	1

Example of Use

To set Uplink PermBase to 0:
1: ULPERMBASE 0
2: ULPERMBASE?
> 0

ULPILOT/ULPILOT?

Uplink Parameters - Pilot Pattern

Function

This command sets Pilot Pattern when the burst type of the uplink input signals is Collaborative burst.

Command

```
ULPILOT mode
```

Query

```
ULPILOT?
```

Response

```
mode
```

Parameter

mode	Pilot Pattern
A	Pilot Pattern A
B	Pilot Pattern B

Example of Use

To set Pilot Pattern to A:

```
1: ULPILOT A
2: ULPILOT?
> A
```

ULPILOTPWR?

Uplink Pilot Subcarrier Power

Function

This command queries the measurement result of Uplink Pilot Subcarrier Power.

Query

ULPILOTPWR?

Response

1

Parameter

1	Pilot Subcarrier Power
Resolution	0.01
Unit	dB

Example of Use

To query Uplink Pilot Subcarrier Power:
ULPILOTPWR?
> 2.50

ULSUBCHOFs/ULSUBCHOFs?

Uplink Subchannel Offset

Function

This command sets the subchannel offset for uplink measurement in slot units. This parameter must be set when measuring an uplink signal.

Command

ULSUBCHOFs n

Query

ULSUBCHOFs?

Response

n

Parameter

n Subchannel Offset
 Range 0 to the value set for Number of Symbols/n – 1
 n (Maximum number of subchannels)

FFT Size	Zone Type	
	PUSC	AMC 2x3
512	17	24
1024	35	48
2048	70	96

Resolution 1

Example of Use

To set Uplink Subchannel Offset to 17:

```
1: ULSUBCHOFs 17
2: ULSUBCHOFs?
> 17
```

ULZONEOFS/ULZONEOFS?

Uplink Zone Offset

Function

This command sets the Uplink Zone Offset for measurement in symbol units.

Command

```
ULZONEOFS n
```

Query

```
ULZONEOFS?
```

Response

```
n
```

Parameter

n	Zone Offset
Range	0 to N -Num of Symbols $N=21$ (5 MHz, 10 MHz, 20 MHz) $N=18$ (8.75 MHz) $N=15$ (3.5 MHz, 7 MHz bandwidth)
Resolution	3

Example of Use

To set Uplink Zone Offset to 0:

```
1: ULZONEOFS 0
2: ULZONEOFS?
> 0
```

ULZONETYPE/ULZONETYPE?

Uplink Parameters - Zone Type

Function

This command sets the zone type for uplink measurement.

Command

```
ULZONETYPE mode
```

Query

```
ULZONETYPE?
```

Response

```
mode
```

Parameter

mode	Zone Type
PUSC	PUSC
AMC23	AMC 2x3

Example of Use

To set PUSC for the zone type.

```
1: ULZONETYPE PUSC
2: ULZONETYPE?
> PUSC
```

UNMODSUBCARRERR?

Uplink Unmodulated Subcarrier Error

Function

This command queries the measurement result of Unmodulated Subcarrier Error.

Query

UNMODSUBCARRERR? unit

Response

1

Parameter

unit	Reading unit
PER	%
DB	dB
1	Unmodulated Subcarrier Error
Resolution	0.01
Unit	Unit specified in unit

Example of Use

To query Unmodulated Subcarrier Error:

1: MEAS ULMOD

2: UNMODSUBCARRERR? PER

ZONE?

DL Zone IE

Function

This command queries the measurement result of the currently selected Zone Index.

Query

ZONE? item

Response

result

Parameter

item Result query item
 result Measurement result

item	Types of Results	result
PRMT	Permutation	PUSC: PUSC FUSC: FUSC OTHER: Other
SYMOFS	Symbol Offset	Decimal, Resolution: 1
SYMBINT	Symbol Interval	Decimal, Resolution: 1
STC	STC / 2/3 antenna select	0: No STC 1: STC using 2 antennas 2: Other
MATRIX	Matrix	0: Matrix A 1: Matrix B 2: No STC/Other
PERMBASE	DLPermBase	Decimal, Resolution: 1
PILOTPWR	Pilot Subcarrier Power	Unit: dB
DATAPWR	Data Subcarrier Power	Unit: dBm
NULLPWR	Null Subcarrier Power	Unit: dB
PUNCTUREDPILOTPWR	Punctured Pilot Power	Unit: dB
AMCTYPE	AMC Type	0 : 2x3 1 : Other This data is valid if PRMT is OTHER.

Example of Use

To query the symbol offset of Zone 1:

1: ZONEINDX 1
 2: ZONE? SYMOFS

ZONEINDX/ZONEINDX?

Zone Index

Function

This command sets Zone Index to be displayed on the DL Map Info. screen. This command is valid only on the DL Map Info. screen.

Command

ZONEINDX n

Query

ZONEINDX?

Response

n

Parameter

n	Zone Index
Range	0 to (Number of the detected zones – 1)
Resolution	1

Example of Use

```
To set Zone Index to 0:
1: ZONEINDX 0
2: ZONEINDX?
> 0
```

