Agilent E7515A UXM
Wireless Test Set

Programmer's Reference

Agilent Technologies

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This product has been designed and tested in accordance with accepted industry standards, and has been supplied in a safe condition. The documentation contains information and warnings that must be followed by the user to ensure safe operation and to maintain the product in a safe condition.

Manual Part Number

E7515-90001

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Agilent Technologies, Inc.

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Electrical Rating

Input Voltage Range: 100/120/220/240 V_{AC}

Input Frequency Range: 50/60Hz, nominal

Input Power Rating: 1100 Watts Max

Mains supply voltage fluctuates up to
+/- 10% of the nominal voltage.

Where to Find the Latest Information

Agilent will periodically update product documentation. For the latest information about this wireless test set, including software upgrades, operating and application information, and product and accessory information, see the following URL: www.agilent.com/find/UXM

Is your product software up-to-date?

Agilent will periodically release software updates to fix known defects and incorporate product enhancements. To search for software updates for your product, go to the Agilent Technical Support website at

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1 Introduction

Welcome to the ***Programmer's Reference*** for the Agilent E7515A UXM Wireless Test Set (UXM). The purpose of this guide is to provide you with all that is required to configure the UXM for remote control as well as the commands needed to operate it. Each command includes a description, range, preset value, return parameters list, and an example of the command used successfully. For additional information, please refer to the UXM Getting Started Guide and User's Guide for this instrument.

About the LTE/LTE-A Test/Lab Application

Agilent E7530A/E7630A LTE/LTE-A Test/Lab Application (TA/LA) enables LTE and LTE-Advanced user equipment (UE) design validation.

The application runs on an embedded Windows controller present in the UXM and uses the provided touch-screen based interface, integrated fading, network emulation and measurement capabilities present in the test set to provide you with a simple to use, bench-top design verification tool.

The software application provides two different operation modes:

- Signaling based mode: In this operation mode, the TA/LA is capable of emulating a single cell LTE and LTE-Advanced network (or dual cell network if you purchased the E7515A-RB1/BB1 as well as the -RA1/BA1). This operation mode enables you to recreate test environments similar to the real-life conditions the UE will encounter during its operation on an actual network including fading and MIMO variations.
  In the signaling operation mode, you are also capable of configuring several communication parameters, ranging from the different modulation and coding schemes, to the size of the bandwidth allocations for both UL and DL, as well as other additional parameters.
  If you have purchased the option -AFP for your TA or FDD version A.02 of the LA , then, you can also configure the DL Carrier Components (CC) and other related Carrier Aggregation requirements. For more information on Carrier Aggregation, visit the 3GPP website's description.
- Non-signaling based mode: In this operation mode, you can configure the test set to generate a compliant broadcast signal, and start the transmission of PDCCH channel with allocations for the UE, without the need to complete an ATTACH procedure with the UXM.

Objective of this Document

This document describes the SCPI command set implemented in the TA/LA to enable you to control it remotely from external software applications.

This document should be used together with the *Agilent E7515A UXM Getting Started Guide* and the *Agilent E7515A UXM User's Guide*.

Latest documentation

For the latest documentation and software updates for the above products, please go to www.agilent.com/find/uxm.

2 General conventions

The TA/LA SCPI implementation only allows the execution of sequential commands. Overlapped SCPI command operation is not supported.

All commands which state return parameters accept the query format.

During normal operation, if you wish to check the correct application of command configuration issued, you can issue the same command in query form to verify successful execution. For some commands, it is recommended to check the "operation complete" status (*OPC?) in order to confirm the execution has been completed before sending the next command.

The TA/LA enters remote-control mode once it detects SCPI commands are being sent to its control interface. The graphical user-interface (GUI) indicates this by displaying a dialogue box that enables you to cancel the remote-control mode. You cannot execute any actions via the GUI while the UXM is being controlled remotely.

The dialogue box enables you to cancel the remote connection at any time.

3 Communication with the instrument

The TA/LA's remote control interface is implemented by means of a standard TCP IP connection.

In order to establish communication with the remote control interface, controlling applications need to open an IP socket to the SCPI commands' port in the TA/LA and send the SCPI strings to this port.

The IP address for the SCPI command interface in the TA/LA is configured by modifying the Windows 7 network configuration for the AUX Ethernet network connection located in the back of the UXM. (This is referenced in the UXM Getting Started Guide as LAN1 and is the upper-most LAN connection in the middle of the rear-panel.) Refer to the UXM Getting Started Guide for details of the UXM rear-panel.

To modify the Windows 7 network configuration, perform the following steps:

1. Select **Start** from the Windows task bar.
2. Select (Windows) **Control Panel, All Control Panel Items**, **Network and Sharing Center**.
3. Double-click on the network connection you wish to configure.
4. Select **Properties**.
5. On the **Networking** tab, select **Internet Protocol version 4 (TCP/IPv4)** in the list.
6. Select **Properties** from this window.
7. Select, **Use the following IP address** radio button.
8. Enter the desired values for:
    a. IP address
    b. Subnet Mask
9. Select **Ok.**

After performing the above steps, send remote commands to port number **55000** whenever you are writing applications to remotely control the TA/LA through the SCPI command interface.

4 Common commands

*OPC

Function

This command sets the "Operation Complete" bit in the Standard Event Status Register, since the TA/LA does not support overlapped command operation.

If executed in query form, this command places "1" in the output queue.

Allowed range when setting the parameter value

None, this command does not accept input parameters.

Returned range when querying the parameter value

This command places a "1" in the output queue.

Preset parameter value

Not applicable

Programming example

Command form

Not applicable

Query form

*OPC?

*RST

Function

This command forces a preset in the TA/LA.

All configuration parameters revert to their default values.

Constraints

This setting can only be changed when the instrument is in the **CELL OFF** state.

Allowed range when setting the parameter value

None, this command does not accept input parameters.

Returned range when querying the parameter value

None, this command does not support query format.

Preset parameter value

Not applicable

Programming example

Command form

*RST

Query form

Not applicable

*IDN?

Function

This command forces the instrument to return an identification string containing information about the version of the TA/LA currently running.

Allowed range when setting the parameter value

None, this command does not accept input parameters.

Returned range when querying the parameter value

This command returns a string with the following format:

For TA

"LTE/LTE-A Test Application, Version <Application version number>, running on E7515A" or

For LA

"LTE/LTE-A Lab Application, Version <Application version number>, running on E7515A"

NOTES:

- Current TA/LA implementation returns TA/LA version number.

Preset parameter value

Not applicable

Programming example

Command form

Not applicable

Query form

*IDN?

SYSTem:VERSion?

Function

This command forces the system (UXM) to return a numeric value indicating the SCPI version to which the instrument conforms.

Allowed range when setting the parameter value

None, this command does not accept input parameters.

Returned range when querying the parameter value

This command returns a string with the following format:

YYYY.V

Where YYYY indicates the year version of the SCPI standard implemented, and V indicates the implemented approved revision.

Preset parameter value

Not applicable

Programming example

Command form

Not applicable

Query form

*SYST:VERS?

5 "CELL" configuration commands

SETup:LTE:DUPLEXmode

Function

This command enables specifying the LTE Duplex Mode to be emulated by the TA/LA application.

Constraints

This setting can only be changed when the UXM is in the **CELL OFF** state.

Allowed range when setting the parameter value

Two settings are available:

- 0, LTE FDD is emulated.
- 1, LTE TDD is emulated.

Returned range when querying the parameter value

Same as previous.

Preset parameter value

By default, the UXM is set to emulated LTE FDD.

Programming example

Command form

SET:LTE:DUPLEX 1

Query form

SET:LTE:DUPLEX?

SETup<carrier_id#>:LTE:DLEARFcn

Function

This command enables setting/querying the configured value for the TA/LA DL EARFCN for each cell. By default, setting a value using this command automatically sets the corresponding value for the UL EARFCN parameter.

When setting the operation EARFCN in the TA/LA, you need to first enter the DL EARFCN value using this SCPI command, and then introduce the UL EARFCN value using the command SETup:LTE:ULEARFcn.

Constraints

This setting can only be changed when the UXM is in the **CELL OFF** state.

Allowed range when setting the parameter value

The following table provides the allowed ranges for this parameter (also included are the values for UL EARFCN parameter):

E-UTRA Operating Band	Downlink
1	0 – 599
2	600 - 1199
3	1200 – 1949
4	1950 – 2399
5	2400 – 2649
6	2650 – 2749
7	2750 – 3449
8	3450 – 3799
9	3800 – 4149
10	4150 – 4749
11	4750 – 4949
12	5010 - 5179
13	5180 – 5279
14	5280 – 5379
...	...
17	5730 – 5849
18	5850 – 5999
19	6000 - 6149
20	6150 – 6449
21	6450 – 6599
...	...
23	7500 – 7699
24	7700 – 8039
25	8040 – 8689
26	8690 – 9039
27	9040 – 9209
28	9210 – 9659

E-UTRA Operating Band	Downlink
29	9660 – 9769
30	9770 – 9869
33	36000 – 36199
34	36200 – 36349
35	36350 – 36949
36	36950 – 37549
37	37550 – 37749
38	37750 – 38249
39	38250 – 38649
40	38650 – 39649
41	39650 – 41589
44	45590 – 46589

Returned range when querying the parameter value

Same as previous.

Preset parameter value

Primary cell DL EARFCN = 2175 (FDD Band 4, middle channel).

Secondary cell DL EARFCN = 5790 (FDD Band 17, middle channel)

Programming example

Command form

SET1:LTE:DLEARF 550

Query form

SET1:LTE:DLEARF?

SETup:LTE:ULEARFcn

Function

This command enables setting/querying the configured value for the TA/LA UL EARFCN for the PCC cell. By default, setting a value for DL EARFCN automatically sets the corresponding value for the UL EARFCN parameter. Therefore, in order to configure UL EARFCN values independently of the values given to the DL EARFCN, it is necessary to configure first DL EARFCN parameter then configure the UL EARFCN parameter.

When setting the operation EARFCN in the TA/LA, you need to first enter the DL EARFCN value using the SCPI command SETup<carrier_id#>:LTE:DLEARFcn and then configure the UL EARFCN value using this SCPI command.

Constraints

This setting can only be changed when the UXM is in the **CELL OFF** state.

Allowed range when setting the parameter value

The following table provides the allowed ranges for this parameter (also included are the values for DL EARFCN parameter):

E-UTRA Operating Band	Uplink
1	18000 – 18599
2	18600 – 19199
3	19200 – 19949
4	19950 – 20399
5	20400 – 20649
6	20650 – 20749
7	20750 – 21449
8	21450 – 21799
9	21800 – 22149
10	22150 – 22749
11	22750 – 22949
12	23010 - 23179
13	23180 – 23279
14	23280 – 23379
...	...
17	23730 – 23849
18	23850 – 23999
19	24000 - 24149
20	24150 – 24449
21	24450 – 24599
...	...
23	25500 – 25699
24	25700 – 26039
25	26040 - 26689
26	26690 – 27039

E-UTRA Operating Band	Uplink
27	27040 – 27209
28	27210 – 27659
29	DL only
30	27660 – 27759
33	36000 – 36199
34	36200 – 36349
35	36350 – 36949
36	36950 – 37549
37	37550 – 37749
38	37750 – 38249
39	38250 – 38649
40	38650 – 39649
41	39650 – 41589
44	45590 – 46589

Returned range when querying the parameter value

Same as previous.

Preset parameter value

Primary cell UL EARFCN = 20175 (FDD Band 4, middle channel).

Programming example

Command form

SET1:LTE:ULEARF 18550

Query form

SET1:LTE:ULEARF?

SETup<carrier_id#>:LTE:DLBANDWidth

Function

This command enables setting/querying the UXM channel bandwidth to be used in the LTE/LTE-A network emulator for each cell, DL direction.

Constraints

This setting can only be changed when the UXM is in the **CELL OFF** state.

Allowed range when setting the parameter value

The following list provides the set of allowed values for this command: 1.4, 3, 5, 10, 15 and 20 MHz.

Returned range when querying the parameter value

Same as previous.

Preset parameter value

Default values for this parameter is 10 MHz.

Programming example

Command form

SET1:LTE:DLBANDW 1.4

Query form

SET2:LTE:DLBANDW?

SETup:LTE:ULBANDWidth

Function

This command enables setting/querying the channel bandwidth to be used in the LTE/LTE-A network emulationor for the PCC cell, UL direction.

Constraints

This setting can only be changed when the UXM is in the **CELL OFF** state.

Allowed range when setting the parameter value

The following list provides the set of allowed values for this command: 1.4, 3, 5, 10, 15 and 20 MHz.

Returned range when querying the parameter value

Same as previous.

Preset parameter value

Default values for this parameter is 10 MHz.

Programming example

Command form

SET1:LTE:ULBANDW 1.4

Query form

SET1:LTE:ULBANDW?

SETup<carrier_id#>:LTE:CPSIZe

Function

This command enables setting/querying the cyclic prefix size to be used in the LTE/LTE-A network emulator for each cell.

Constraints

This setting can only be changed when the UXM is in the **CELL OFF** state.

Allowed range when setting the parameter value

The following table provides the set of allowed setting values for this parameter:

3GPP specification	Setting value
Normal cyclic prefix size	0
Extended cyclic prefix size	1

Returned range when querying the parameter value

Same as previous.

Preset parameter value

The default value for this parameter is "Normal cyclic prefix size" (0).

Programming example

Command form

SET1:LTE:CPSIZ 1

Query form

SET1:LTE:CPSIZ?

SETup<carrier_id#>:LTE:CELLID

Function

This command enables setting/querying the PHY layer cell ID value for the LTE/LTE-A network emulator for each cell.

Constraints

This setting can only be changed when the UXM is in the **CELL OFF** state.

Allowed range when setting the parameter value

The allowed range of values when setting this parameter is 0 to 503.

Returned range when querying the parameter value

Same as previous.

Preset parameter value

For primary cell the default PHY layer cell ID value is 1.

For secondary cell the default PHY layer cell ID value is 3.

Programming example

Command form

SET1:LTE:CELLID 5

Query form

SET1:LTE:CELLID?

SETup<carrier_id#>:LTE:POWLVL

Function

This command enables setting/querying the configured RS EPRE level for the LTE/LTE-A network emulator for each cell.

Allowed range when setting the parameter value

The range allowed for configuration in the TA/LA is -145 to -10 dBm/15 kHz.

Returned range when querying the parameter value

Same as above.

Preset parameter value

The default value for this parameter is -60 dBm/15 kHz.

Programming example

Command form

SET1:LTE:POWLVL -75

Query form

SET1:LTE:POWLVL?

SETup<carrier_id#>:LTE: TOTALPOWLVL

This command enables setting/querying the configured Channel BW power level for the LTE/LTE-A network emulator for each cell. This parameter represents the integrated power level assuming all resource elements in the bandwidth are occupied and transmitted at the same power level as the Reference Signals.

Allowed range when setting the parameter value

The range allowed for configuration in the TA/LA is -117.2 to 17.8 dBm/x MHz. Where "x" is the configured bandwidth.

Returned range when querying the parameter value

Same as above.

Preset parameter value

The default value for this parameter is -32.2 dBm/10 MHz.

Command form

SET1:LTE:TOTALPOWLVL -32.2

Query form

SET1:LTE:TOTALPOWLVL?

SETup<carrier_id#>:LTE:SIMPATHLOSS

Function

This command enables configuring the value of the Reference Signal Power value for each cell, signaled in the SIB2 broadcast message (within the PDSCH common configuration) as per the following formula:

Reference Signal Power = Simulated Path Loss + Cell Power Level

Constraints

This setting can only be changed when the UXM is in the **CELL OFF** state.

Allowed range when setting the parameter value

The Reference Signal Power field in the SIB2 broadcast message can take integer values or the same decimal value as Cell Power within the -60 and 50 range.

Therefore, you must ensure that the set value for the Simulated Path Loss parameter, when added to the currently configured Cell Power Level parameter value is within the above range.

Values outside the defined range are ignored.

Returned range when querying the parameter value

Same as above.

Preset parameter value

The default value for this parameter is 84 dB.

Programming example

Command form

SET1:LTE:SIMPATHLOSS -75

Query form

SET1:LTE:SIMPATHLOSS?

SETup<carrier_id#>:LTE:MCC

Function

Set/queries the Mobile Country Code to be used for the LTE/LTE-A network emulator for each cell.

Constraints

This setting can only be changed when the UXM is in the **CELL OFF** state.

Allowed range when setting the parameter value

0 to 999

Returned range when querying the parameter value

0 to 999

Preset parameter value

1

Programming example

Command form

SET1:LTE:MCC 1

Query form

SET1:LTE:MCC?

SETup<carrier_id#>:LTE:MNC

Function

Sets/queries the Mobile Network Code (MNC) to be used for the LTE/LTE-A network emulation for each cell.

Constraints

This setting can only be changed when the UXM is in the **CELL OFF** state.

Allowed range when setting the parameter value

0 to 999

Returned range when querying the parameter value

0 to 999

Preset parameter value

1

Programming example

Command form

SET1:LTE:MNC 1

Query form

SET1:LTE:MNC?

SETup:LTE:FRAMECFG

Function

This command enables setting/querying the configured value for the LTE TDD network emulation frame configuration, which actually allows specifying the number of UL and DL subframes that are used when in TDD operation.

This parameter is only applicable when in TDD operation, as commanded by parameter described in "CELL" configuration commands.

Constraints

This setting can only be changed when the UXM is in the **CELL OFF** state.

Allowed range when setting the parameter value

The following table provides the allowed ranges for this parameter:

UL-DL Frame Configuration	DL to UL Switch Point Period	Subframe Number									
		0	1	2	3	4	5	6	7	8	9
1	5 ms	D	S	U	U	D	D	S	U	U	D
2	5 ms	D	S	U	D	D	D	S	U	D	D
3	10 ms	D	S	U	U	U	D	D	D	D	D
4	10 ms	D	S	U	U	D	D	D	D	D	D
5	10 ms	D	S	U	D	D	D	D	D	D	D
6	5 ms	D	S	U	U	U	D	S	U	U	D

Returned range when querying the parameter value

Same as previous.

Preset parameter value

UL-DL frame configuration = 1.

Programming example

Command form

SET:LTE:FRAMECFG 1

Query form

SET:LTE:FRAMECFG?

SETup:LTE:SPCSUBFRAMECFG

Function

This command enables setting/querying the configured value for the LTE TDD network emulation special sub-frame configuration, which actually allows specifying the sizes of the DwPTS, UpPTS and GP fields in the special subframe that is used when in TDD operation.

This parameter is only applicable when in TDD operation, as commanded by parameter described in "CELL" configuration commands.

Constraints

This setting can only be changed when the UXM is in the **CELL OFF** state.

Allowed range when setting the parameter value

The following table provides the allowed ranges for this parameter:

Special Subframe Configuration	Normal Cyclic Prefix in DL			Extended Cyclic Prefix in DL		
	DwPTS	UpPTS		DwPTS	UpPTS	
		Normal Cyclic Prefix in UL	Extended Cyclic Prefix in UL		Normal Cyclic Prefix in UL	Extended Cyclic Prefix in UL
0	$6592 \cdot T_s$	$2192 \cdot T_s$	$2560 \cdot T_s$	$7680 \cdot T_s$	$2192 \cdot T_s$	$2560 \cdot T_s$
1	$19760 \cdot T_s$			$20480 \cdot T_s$		
2	$21952 \cdot T_s$			$23040 \cdot T_s$		
3	$24144 \cdot T_s$			$25600 \cdot T_s$		
4	$26336 \cdot T_s$			$7680 \cdot T_s$	$4384 \cdot T_s$	$5120 \cdot T_s$
5	$6592 \cdot T_s$	$4384 \cdot T_s$	$5120 \cdot T_s$	$20480 \cdot T_s$		
6	$19760 \cdot T_s$			$23040 \cdot T_s$		
7	$21952 \cdot T_s$			-	-	-
8	$24144 \cdot T_s$			-	-	-

Returned range when querying the parameter value

Same as previous.

Preset parameter value

Special sub-frame configuration = 0.

Programming example

Command form

SET:LTE:SPCSUBFRAMECFG 0

Query form

SET:LTE:SPCSUBFRAMECFG?

6 "Rel10" configuration commands

SETup:LTE:CARRIERAGGREGATION:STATE

Function

Sets/queries the carrier aggregation state to be used for the LTE/LTE-A network emulation.

Constraints

This setting can only be changed when the UXM is in the **CELL OFF** state.

Allowed range when setting the parameter value

Two settings are available:

0, carrier aggregation is disabled.

1, carrier aggregation is enabled.

Returned range when querying the parameter value

Same as previous.

Preset parameter value

0: Carrier aggregation is disabled.

Programming example

Command form

SET:LTE:CARRIERAGG:STAT 1

Query form

SET:LTE:CARRIERAGG:STAT?

SETup:LTE:SCCTIMINGdifference

Function

Sets/queries the SCC Timing difference values to be used for the LTE/LTE-A network emulation in carrier aggregation.

Constraints

This setting can only be changed when the UXM is in the **CELL OFF** state. It is only applicable when carrier aggregation is enabled.

Allowed range when setting the parameter value

Possible values for that parameter are integer values from -922 to +922. The units are "Ts".

Returned range when querying the parameter value

Same as previous.

Preset parameter value

Default delay value is 0 Ts

Programming example

Command form

SET:LTE:SCCTIMING -10

Query form

SET:LTE:SCCTIMING?

SETup<carrier_id#>:LTE:CSIREFSIGNalsconfiguration:STATe

Function

Sets/queries the CSI Reference Signal state to be used for the LTE/LTE-A network emulation for each cell.

Constraints

This setting can only be changed when the UXM is in the **CELL OFF** state.

Allowed range when setting the parameter value

Two settings are available:

0, CSI Reference Signal is disabled.

1, CSI Reference Signal is enabled.

Returned range when querying the parameter value

Same as previous.

Preset parameter value

Default value is 0 (CSI Reference Signal disabled)

Programming example

Command form

SET1:LTE:CSIREFSIGN:STAT 1

Query form

SET1:LTE:CSIREFSIGN:STAT?

SETup<carrier_id#>:LTE:CSIREFSIGNalsconfiguration:ANTENNAPORTS

Function

Sets/queries the Antenna ports number in CSI Reference Signal, to be used for the LTE/LTE-A network emulation for each cell.

Constraints

This setting can only be changed when the UXM is in the **CELL OFF** state. It is only applicable when CSI Reference Signal is enabled.

Allowed range when setting the parameter value

The allowed range of values for this parameter is given in the following table:

1	2	4

Returned range when querying the parameter value

Same as previous

Preset parameter value

Default value is 1

Programming example

Command form

SET1:LTE:CSIREFSIGN:ANTENNAPORT 2

Query form

SET1:LTE:CSIREFSIGN:ANTENNAPORT?

SETup<carrier_id#>:LTE:CSIREFSIGNalsconfiguration:RESOURCECFG

Function

Sets/queries the resource configuration for CSI Reference Signal, to be used for the LTE/LTE-A network emulation for each cell.

Constraints

This setting can only be changed when the UXM is in the **CELL OFF** state. It is only applicable when CSI Reference Signal is enabled.

Allowed range when setting the parameter value

The range allowed for configuration in the TA/LA is 0 to 31.

Returned range when querying the parameter value

Same as previous

Preset parameter value

Default value is 0.

Programming example

Command form

SET1:LTE:CSIREFSIGN:RESOURCECFG 20

Query form

SET1:LTE:CSIREFSIGN:RESOURCECFG?

SETup<carrier_id#>:LTE: CSIREFSIGNalsconfiguration:SUBFRAMECFG

Function

Sets/queries the subframe configuration for CSI Reference Signal, to be used for the LTE/LTE-A network emulation for each cell.

Constraints

This setting can only be changed when the UXM is in the **CELL OFF** state. It is only applicable when CSI Reference Signal is enabled.

Allowed range when setting the parameter value

The range allowed for configuration in the TA/LA is 0 to 154.

Returned range when querying the parameter value

Same as previous

Preset parameter value

Default value is 0

Programming example

Command form

SET1:LTE:CSIREFSIGN:SUBFRAMECFG 30

Query form

SET1:LTE:CSIREFSIGN:SUBFRAMECFG?

SETup<carrier_id#>:LTE:CSIREFSIGNalsconfiguration:PC

Function

Sets/queries the P-C configuration at CSI Reference Signal, to be used for the LTE/LTE-A network emulation for each cell.

Constraints

This setting can only be changed when the UXM is in the **CELL OFF** state. It is only applicable when CSI Reference Signal is enabled.

Allowed range when setting the parameter value

The range allowed for configuration in the TA/LA is -8 to 15 dB.

Returned range when querying the parameter value

Same as previous.

Preset parameter value

Default value is 0

Programming example

Command form

SET1:LTE:CSIREFSIGN:CSIREFSIGN:PC 4

Query form

SET1:LTE:CSIREFSIGN:PC?

SETup<carrier_id#>:LTE:CSIREFSIGNalsconfiguration:ZEROPOWer:RESOURCE CFG

Function

Sets/queries the ZeroPower Resource configuration for CSI Reference Signal, to be used for the LTE/LTE-A network emulation for each cell.

Constraints

This setting can only be changed when the UXM is in the **CELL OFF** state. It is only applicable when CSI Reference Signal is enabled.

Allowed range when setting the parameter value

This parameter must be a bit string of 16 bits. Valid values are

- If FDD and Cyclic prefix is "Normal": xxxxxxxxxx000000
- If FDD and Cyclic prefix is "Extended": xxxxxxxx00000000
- If TDD, Antenna ports for data = < 2, and Cyclic prefix is "Normal": xxxxxxxxxxxxxxxx
- If TDD, Antenna ports for data = 4, and Cyclic prefix is "Normal": xxxxxxxxxx000000
- If TDD, Antenna ports for data = < 2, and Cyclic prefix is "Extended": xxxxxxxxxxxxxx00
- If TDD, Antenna ports for data = 4, and Cyclic prefix is "Extended": xxxxxxxx00000000

Returned range when querying the parameter value

Same as previous.

Preset parameter value

Default value is "0000000000000000"

Programming example

Command form

SET1:LTE:CSIREFSIGN:ZEROPOWer:RESOURCECFG "0101000000000000"

Query form

SET1:LTE:CSIREFSIGN:ZEROPOWer:RESOURCECFG?

SETup<carrier_id#>:LTE:CSIREFSIGNalsconfiguration:ZEROPOWer:SUBFRAMECFG

Function

Sets/queries the ZeroPower Subframe configuration for CSI Reference Signal, to be used for the LTE/LTE-A network emulation for each cell.

Constraints

This setting can only be changed when the UXM is in the **CELL OFF** state. It is only applicable when CSI Reference Signal is enabled.

Allowed range when setting the parameter value

The range allowed for configuration in the TA/LA is 0 to 154.

Returned range when querying the parameter value

Same as previous.

Preset parameter value

Default value is 0

Programming example

Command form

SET1:LTE:CSIREFSIGN:ZEROPOWer:SUBFRAMECFG 10

Query form

SET1:LTE:CSIREFSIGN:ZEROPOWer:SUBFRAMECFG?

7 "RMC" configuration commands

SETup<carrier_id#>:LTE:RMC:DL:TXMODe

Function

This parameter allows configuring the transmission mode to be used for DL allocations for each cell.

Constraints

This setting can only be changed when the UXM is in the **CELL OFF** state.

Allowed range when setting the parameter value

The following table provides the set of values allowed when setting this parameter:

Transmission mode 1	0
Transmission mode 2	1
Transmission mode 3	2
Transmission mode 4	3
Transmission mode 6	5
Transmission mode 7 SISO	6
Transmission mode 7 MIMO	7
Transmission mode 8	8

Note that transmission mode 1 is only applicable for single antenna configurations, whereas the remainding transmission modes require multiple antenna configurations.

Returned range when querying the parameter value

Same as previous.

Preset parameter value

Default Transmission Mode is 0.

Programming example

Command form

SET1:LTE:RMC:DL:TXMOD 1

Query form

SET1:LTE:RMC:DL:TXMOD?

SETup<carrier_id#>:LTE:RMC:DL:IMCS[:ALL]

Function

This parameter enables configuration of the I_{MCS} (modulation and target coding scheme) to be used in the DL allocations provided to the UE. This command sets the provided I_{MCS} to all DL sub-frames and codewords within the frame for each cell. The configuration made through this command does not actually apply until the related control commands to disconnect and connect again DL are executed (see section "Operation Commands").

Allowed range when setting the parameter value

The following table provides the set of values allowed when setting this parameter:

MCS Index I_{MCS}	Modulation Order Q_m	TBS Index I_{TBS}
0	QPSK	0
1	QPSK	1
2	QPSK	2
3	QPSK	3
4	QPSK	4
5	QPSK	5
6	QPSK	6
7	QPSK	7
8	QPSK	8
9	QPSK	9
10	16-QAM	9
11	16-QAM	10
12	16-QAM	11
13	16-QAM	12
14	16-QAM	13
15	16-QAM	14

MCS Index I_{MCS}	Modulation Order Q_m	TBS Index I_{TBS}
16	16-QAM	15
17	64-QAM	15
18	64-QAM	16
19	64-QAM	17
20	64-QAM	18
21	64-QAM	19
22	64-QAM	20
23	64-QAM	21
24	64-QAM	22
25	64-QAM	23
26	64-QAM	24
27	64-QAM	25
28	64-QAM	26
40	CQI based*	-

*__NOTE__: "CQI based" value can only be configured when CSI based scheduler is enabled for the cell.

Returned range when querying the parameter value

This command's query form provides a list of the configured I_{MCS} values for the DL sub-frames within a frame for both codewords.

Preset parameter value

Default I_{MCS} index configured in the UXM is 28.

Programming example

Command form

SET1:LTE:RMC:DL:IMCS 2

Query form

SET1:LTE:RMC:DL:IMCS?

SETup<carrier_id#>:LTE:RMC:DL:IMCS:SFN<sub_frame#>:[ALLCW]

Function

This parameter enables configuration of the I_{MCS} (modulation and target coding scheme) to be used in the DL allocations provided to the UE for both codewords in a specific sub-frame within a complete frame for each

cell. The configuration made through this command does not actually apply until the related control commands to disconnect and connect again DL are executed (see section "Operation Commands").

Allowed range when setting the parameter value

The following table provides the set of values allowed when setting this parameter:

MCS Index I_{MCS}	Modulation Order Q_m	TBS Index I_{TBS}
0	QPSK	0
1	QPSK	1
2	QPSK	2
3	QPSK	3
4	QPSK	4
5	QPSK	5
6	QPSK	6
7	QPSK	7
8	QPSK	8
9	QPSK	9
10	16-QAM	9
11	16-QAM	10
12	16-QAM	11
13	16-QAM	12
14	16-QAM	13
15	16-QAM	14
16	16-QAM	15
17	64-QAM	15
18	64-QAM	16
19	64-QAM	17
20	64-QAM	18
21	64-QAM	19
22	64-QAM	20
23	64-QAM	21
24	64-QAM	22
25	64-QAM	23

MCS Index I_{MCS}	Modulation Order Q_m	TBS Index I_{TBS}
26	64-QAM	24
27	64-QAM	25
28	64-QAM	26
40	CQI based*	-

***NOTE**: "CQI based" value can only be configured when CSI based scheduler is enabled for the cell.

Returned range when querying the parameter value

This command's query form provides a list of the configured I_{MCS} values for the specified DL sub-frame for each codeword (if more than one codeword exists.)

Preset parameter value

Default I_{MCS} index configured in the UXM is 28.

Programming example

Command form

SET1:LTE:RMC:DL:IMCS:SFN4 2

Query form

SET1:LTE:RMC:DL:IMCS:SFN7?

SETup<carrier_id#>:LTE:RMC:DL:IMCS:SFN<sub_frame#>:CW<codeword#>

Function

This parameter enables configuration of the I_{MCS} (modulation and target coding scheme) to be used in the DL allocations provided to the UE for a specific sub-frame and a specific codeword, for for each cell. When more than one codeword is used. <codeword#> can be 1 or 2. The configuration made through this command does not actually apply till the related control commands to disconnect and connect again DL are executed (see section "Operation Commands").

Allowed range when setting the parameter value

The following table provides the set of values allowed when setting this parameter:

MCS Index I_{MCS}	Modulation Order Q_m	TBS Index I_{TBS}
0	QPSK	0
1	QPSK	1

MCS Index I_{MCS}	Modulation Order Q_m	TBS Index I_{TBS}
2	QPSK	2
3	QPSK	3
4	QPSK	4
5	QPSK	5
6	QPSK	6
7	QPSK	7
8	QPSK	8
9	QPSK	9
10	16-QAM	9
11	16-QAM	10
12	16-QAM	11
13	16-QAM	12
14	16-QAM	13
15	16-QAM	14
16	16-QAM	15
17	64-QAM	15
18	64-QAM	16
19	64-QAM	17
20	64-QAM	18
21	64-QAM	19
22	64-QAM	20
23	64-QAM	21
24	64-QAM	22
25	64-QAM	23
26	64-QAM	24
27	64-QAM	25
28	64-QAM	26
40	CQI based*	-

*__NOTE__: "CQI based" value can only be configured when CSI based scheduler is enabled for the cell. Configuring this value in one codeword automatically configures the same for the other one.

Returned range when querying the parameter value

This command's query form provides the value of the configured I_{MCS} values for the specified DL sub-frame and codeword.

Preset parameter value

Default I_{MCS} index configured in the UXM is 28.

Programming example

Command form

SET1:LTE:RMC:DL:IMCS:SFN3:CW2 4

Query form

SET1:LTE:RMC:DL:IMCS:SFN3:CW2?

SETup<carrier_id#>:LTE:RMC:DL:FRAMEREPetitionperiod

Function

This command enables specifying how often the currently configured frame-based DL RMC is repeated for each cell. The configuration made through this command does not actually apply until the related control commands to disconnect and connect again DL are executed (see section "Operation Commands").

Allowed range when setting the parameter value

This command enables configuring repetition periods of 1 (UE is allocated in DL every frame) to 100 frames.

Returned range when querying the parameter value

Same as above.

Preset parameter value

Default frame repetition period is 1.

Programming example

Command form

SET1:LTE:RMC:DL:FRAMEREP 5

Query form

SET1:LTE:RMC:DL:FRAMEREP?

SETup<carrier_id#>:LTE:RMC:DL:ALLOCSIZe[:ALL]

Function

This parameter enables configuration of the size of the allocation to be provided to the UE for each cell, specifying the number of PRBs, for the DL direction, to be allocated in all sub-frames. The configuration made through this command does not actually apply until the related control commands to disconnect and connect again DL are executed (see section "Operation Commands").

Allowed range when setting the parameter value

The minimum value that can be configured is 1, meaning that the UE is provided an allocation of 1 PRB in each and every configured TTI period.

The maximum value is given by the following table:

1.4 MHz BW	3 MHz BW	5 MHz BW	10 MHz BW	15 MHz BW	20 MHz BW
6	15	25	50	75	100

In any case, this parameter is also dependant on the DCI format used to signal the allocation to the UE. Refer to the *Agilent E7515A UXM User's Guide* for details.

Of course, the currently configured value for the DL allocation size parameter must also be taken into account.

Returned range when querying the parameter value

This command's query form returns a list of the allocation size in each DL sub-frame.

Preset parameter value

Default allocation size is 50.

Programming example

Command form

SET1:LTE:RMC:DL:ALLOCSIZ 5

Query form

SET1:LTE:RMC:DL:ALLOCSIZ?

SETup<carrier_id#>:LTE:RMC:DL:ALLOCSIZe:SFN<sub_frame#>

Function

This parameter enables configuration of the size of the allocation to be provided to the UE for each cell, specifying the number of PRBs, for the DL direction, to be allocated in a specific sub-frame. The configuration made through this command does not actually apply until the related control commands to disconnect and connect again DL are executed (see section "Operation Commands").

Allowed range when setting the parameter value

The minimum value that can be configured is 1, meaning that the UE is provided an allocation of 1 PRB for the indicated subframe with a frame periodicity equal to the configured frame repetition period.

The maximum value is given by the following table:

1.4 MHz BW	3 MHz BW	5 MHz BW	10 MHz BW	15 MHz BW	20 MHz BW
6	15	25	50	75	100

In any case, this parameter is also dependent on the DCI format used to signal the allocation to the UE. Refer to *Agilent E7515A UXM User's Guide* for details.

Of course, the currently configured value for the DL allocation offset parameter must also be taken into account.

Returned range when querying the parameter value

This command's query form returns a list of the allocation size in the specified DL sub-frame.

Preset parameter value

Default allocation size is 1.

Programming example

Command form

SET1:LTE:RMC:DL:ALLOCSIZ:SFN4 5

Query form

SET1:LTE:RMC:DL:ALLOCSIZ:SFN7?

SETup<carrier_id#>:LTE:RMC:DL:ALLOCOFFset[:ALL]

Function

This parameter enables configuring the offset (in number of PRBs) from the lower frequencies in the system bandwidth for the bandwidth allocation for the DL direction, for all sub-frames within a frame for each cell. The configuration made through this command does not actually apply till the related control commands to disconnect and connect again DL are executed (see section "Operation Commands").

Allowed range when setting the parameter value

The minimum value that can be configured is 0, while the maximum value varies according to the configured system bandwidth for the downlink direction and the selected DL allocation size.

In any case, this parameter is also dependant of the DCI format used to signal the allocation to the UE. Refer to *Agilent E7515A UXM User's Guide* for details.

Returned range when querying the parameter value

This command's query form returns a list of the configured allocation offsets for all sub-frames in DL direction.

Preset parameter value

Default DL allocation offset is 50.

Programming example

Command form

SET1:LTE:RMC:DL:ALLOCOFF 10

Query form

SET1:LTE:RMC:DL:ALLOCOFF?

SETup<carrier_id #>:LTE:RMC:DL:ALLOCOFFset:SFN<sub_frame#>

Function

This parameter enables configuration of the offset (in number of PRBs) from the lower frequencies in the system bandwidth for the bandwidth allocation for the DL direction, for the specified sub-frame within a frame for each cell. The configuration made through this command does not actually apply until the related control commands to disconnect and connect again DL are executed (see section "Operation Commands").

Allowed range when setting the parameter value

The minimum value that can be configured is 0, while the maximum value varies according to the configured system bandwidth for the downlink direction and the selected DL allocation size.

In any case, this parameter is also dependant of the DCI format used to signal the allocation to the UE. Refer to *Agilent E7515A UXM User's Guide* for details.

Returned range when querying the parameter value

This command's query form returns a list of the configured allocation offsets for all sub-frames in DL direction.

Preset parameter value

Default DL allocation offset is 0.

Programming example

Command form

SET1:LTE:RMC:DL:ALLOCOFF:SFN4 10

Query form

SET1:LTE:RMC:DL:ALLOCOFF:SFN7?

SETup<carrier_id#>:LTE:RMC:DL:ALLOCBITMAP[:ALL]

Function

This parameter enables configuration of non-consecutive allocation of Resource Block Groups in the DL for each cell, when the transmission mode selected allows you to do this. The configuration made through this command does not actually apply until the related control commands to disconnect and connect again (DL) are executed (see section "Operation Commands").

Allowed range when setting the parameter value

This parameter must be a bit string where the length depends on the bandwidth configured in the system:

- 6 bits, in case of BW = 1.4 MHz
- 8 bits, in case of BW = 3MHz
- 13 bits, in case of BW = 5MHz
- 17 bits, in case of BW = 10MHz
- 19 bits, in case of BW = 15MHz
- 25 bits, in case of BW = 20MHz

Returned range when querying the parameter value

Same as previous.

Preset parameter value

Default I_{MCS} index configured in the system is "1111111111111111"

Programming example

Command form

SET1:LTE:RMC:DL:ALLOCBITMAP:ALL "1010111111111110"

Query form

SET1:LTE:RMC:DL:ALLOCBITMAP:ALL?

SETup<carrier_id#>:LTE:RMC:DL:ALLOCBITMAP:SFN<sub_frame#>

Function

This parameter enables configuration of the non-consecutive allocation of Resource Block Groups for a specific sub-frame within a complete frame for each cell, when the transmission mode selected in the cell allows you to do this. The configuration made through this command does not actually apply until the related control commands to disconnect and connect again (DL) are executed (see section "Operation Commands").

Allowed range when setting the parameter value

This parameter must be a bit string which length depends on the bandwidth configured in the system:

- 6 bits, in case of BW = 1.4 MHz
- 8 bits, in case of BW = 3MHz
- 13 bits, in case of BW = 5MHz
- 17 bits, in case of BW = 10MHz
- 19 bits, in case of BW = 15MHz
- 25 bits, in case of BW = 20MHz

Returned range when querying the parameter value

Same as previous.

Preset parameter value

Default I_{MCS} index configured in the system is "1111111111111111"

Programming example

Command form

SET1:LTE:RMC:DL:ALLOCBITMAP:SFN4 "1010111111111110"

Query form

SET1:LTE:RMC:DL:ALLOCBITMAP:SFN4?

SETup:LTE:RMC:UL:IMCS[:ALL]

Function

This parameter enables configuring the I_{MCS} (modulation and target coding scheme) to be used in the UL allocations provided to the UE. This command sets the provided I_{MCS} to all UL sub-frames within the frame. The configuration made through this command does not actually apply till the related control commands to disconnect and connect again UL are executed (see section "Operation Commands").

Allowed range when setting the parameter value

The following table provides the set of values allowed when setting this parameter:

MCS Index I_{MCS}	Modulation Order Q'_m	TBS Index I_{TBS}
0	QPSK	0
1	QPSK	1

MCS Index I_{MCS}	Modulation Order Q'_m	TBS Index I_{TBS}
2	QPSK	2
3	QPSK	3
4	QPSK	4
5	QPSK	5
6	QPSK	6
7	QPSK	7
8	QPSK	8
9	QPSK	9
10	QPSK	10
11	16-QAM	10
12	16-QAM	11
13	16-QAM	12
14	16-QAM	13
15	16-QAM	14
16	16-QAM	15
17	16-QAM	16
18	16-QAM	17
19	16-QAM	18
20	16-QAM	19
21	64-QAM	19
22	64-QAM	20
23	64-QAM	21
24	64-QAM	22
25	64-QAM	23
26	64-QAM	24
27	64-QAM	25
28	64-QAM	26

Note that, according to the 3GPP specifications, support of 64QAM modulation is not mandatory for the UE.

Returned range when querying the parameter value

This command's query form provides a list of the configured I_{MCS} values for the UL sub-frames within a frame.

Preset parameter value

Default I_{MCS} index configured in the system is 20.

Programming example

Command form

SET1:LTE:RMC:UL:IMCS 2

Query form

SET1:LTE:RMC:UL:IMCS?

SETup:LTE:RMC:UL:IMCS:SFN<sub_frame#>

Function

This parameter enables configuration of the I_{MCS} (modulation and target coding scheme) to be used in the UL allocations provided to the UE for a specific sub-frame within a complete frame. The configuration made through this command does not actually apply until the related control commands to disconnect and connect again UL are executed (see section "Operation Commands").

Allowed range when setting the parameter value

The following table provides the set of values allowed when setting this parameter:

MCS Index I_{MCS}	Modulation Order Q'_m	TBS Index I_{TBS}
0	QPSK	0
1	QPSK	1
2	QPSK	2
3	QPSK	3
4	QPSK	4
5	QPSK	5
6	QPSK	6
7	QPSK	7
8	QPSK	8
9	QPSK	9
10	QPSK	10
11	16-QAM	10
12	16-QAM	11
13	16-QAM	12

MCS Index I_{MCS}	Modulation Order Q'_m	TBS Index I_{TBS}
14	16-QAM	13
15	16-QAM	14
16	16-QAM	15
17	16-QAM	16
18	16-QAM	17
19	16-QAM	18
20	16-QAM	19
21	64-QAM	19
22	64-QAM	20
23	64-QAM	21
24	64-QAM	22
25	64-QAM	23
26	64-QAM	24
27	64-QAM	25
28	64-QAM	26

Note that, according to the 3GPP specifications, support of 64QAM modulation is not mandatory for the UE.

Returned range when querying the parameter value

This command's query form provides the value of the configured I_{MCS} values for the specified UL sub-frame.

Preset parameter value

Default I_{MCS} index configured in the system is 20.

Programming example

Command form

SET:LTE:RMC:UL:IMCS:SFN4 2

Query form

SET:LTE:RMC:UL:IMCS:SFN7?

SETup:LTE:RMC:UL:FRAMEREPetitionperiod

Function

This command enables specifying how often the currently configured frame-based UL RMC is repeated. The configuration made through this command does not actually apply till the related control commands to disconnect and connect again UL are executed (see section "Operation Commands").

Allowed range when setting the parameter value

This command enables configuring repetition periods of 1 (UE is allocated in UL every frame) to 100 frames.

Returned range when querying the parameter value

Same as previous.

Preset parameter value

Default frame repetition period is 1.

Programming example

Command form

SET:LTE:RMC:UL:FRAMEREP 5

Query form

SET:LTE:RMC:UL:FRAMEREP?

SETup:LTE:RMC:UL:ALLOCSIZe[:ALL]

Function

This parameter enables configuration of the size of the allocation to be provided to the UE, specifying the number of PRBs, for the UL direction, to be allocated in all sub-frames. The configuration made through this command does not actually apply until the related control commands to disconnect and connect again UL are executed (see section "Operation Commands").

Allowed range when setting the parameter value

The minimum value that can be configured is 1, meaning that the UE is provided an allocation of 1 PRB in each and every configured TTI period.

The maximum value is given by the following table:

1.4 MHz BW	3 MHz BW	5 MHz BW	10 MHz BW	15 MHz BW	20 MHz BW
6	15	25	50	75	100

Of course, the currently configured value for the UL allocation offset parameter must also be taken into account.

Returned range when querying the parameter value

This command's query form returns a list of the allocation size in each UL sub-frame.

Preset parameter value

Default allocation size is 50.

Programming example

Command form

SET:LTE:RMC:UL:ALLOCSIZ 50

Query form

SET:LTE:RMC:UL:ALLOCSIZ?

SETup:LTE:RMC:UL:ALLOCSIZe:SFN<sub_frame#>

Function

This parameter enables configurating the size of the allocation to be provided to the UE, specifying the number of PRBs, for the UL direction, to be allocated in the specified sub-frame. The configuration made through this command does not actually apply until the related control commands to disconnect and connect again UL are executed (see section "Operation Commands").

Allowed range when setting the parameter value

The minimum value that can be configured is 1, meaning that the UEis provided an allocation of 1 PRB in each and every configured TTI period.

The maximum value is given by the following table:

1.4 MHz BW	3 MHz BW	5 MHz BW	10 MHz BW	15 MHz BW	20 MHz BW
6	15	25	50	75	100

Of course, the currently configured value for the UL allocation offset parameter must also be taken into account.

Returned range when querying the parameter value

This command's query form returns a list of the allocation size in the specified UL sub-frame.

Preset parameter value

Default allocation size is 50.

Programming example

Command form

SET:LTE:RMC:UL:ALLOCSIZ:SFN4 50

Query form

SET:LTE:RMC:UL:ALLOCSIZ:SFN7?

SETup:LTE:RMC:UL:ALLOCOFFset[:ALL]

Function

This parameter enables configuration of the offset (in number of PRBs) from the lower frequencies in the system bandwidth for the bandwidth allocation for the UL direction, for all sub-frames within a frame. The configuration made through this command does not actually apply until the related control commands to disconnect and connect again UL are executed (see section "Operation Commands").

Allowed range when setting the parameter value

The minimum value that can be configured is 0, while the maximum value varies according to the configured system bandwidth for the uplink direction and the selected UL allocation size.

Returned range when querying the parameter value

This command's query form returns a list of the configured allocation offsets for all sub-frames in UL direction.

Preset parameter value

Default DL allocation offset is 0.

Programming example

Command form

SET:LTE:RMC:UL:ALLOCOFF 5

Query form

SET:LTE:RMC:UL:ALLOCOFF?

SETup:LTE:RMC:UL:ALLOCOFFset:SFN<sub_frame#>

Function

This parameter enables configuring the offset (in number of PRBs) from the lower frequencies in the system bandwidth for the bandwidth allocation for the UL direction, for the specified sub-frame within a frame. The configuration made through this command does not actually apply until the related control commands to disconnect and connect again UL are executed (see section "Operation Commands").

Allowed range when setting the parameter value

The minimum value that can be configured is 0, while the maximum value varies according to the configured system bandwidth for the uplink direction and the selected UL allocation size.

Returned range when querying the parameter value

This command's query form returns a list of the configured allocation offsets for the specified sub-frame in UL direction.

Preset parameter value

Default DL allocation offset is 0.

Programming example

Command form

SET:LTE:RMC:UL:ALLOCOFF:SFN4 5

Query form

SET:LTE:RMC:UL:ALLOCOFF:SFN7?

SETup:LTE:RMC:UL:CSI[:ALL]

Function

This parameter enables activating or deactivating CSI request in UL.

Allowed range when setting the parameter value

Two settings are available:

- 0, CSI report not required in UL.
- 1, CSI report on Serving cell required.

Returned range when querying the parameter value

Same as previous.

Preset parameter value

Default value is 0 (CSI request disabled).

Programming example

Command form

SET:LTE:RMC:UL:CSI 1

Query form

SET:LTE:RMC: UL:CSI?

SETup:LTE:RMC:UL:CSI:SFN<sub_frame#>

Function

This parameter indicates the subframes in which the CQI reports are requested to the UE.

Allowed range when setting the parameter value

Two settings are available:

- 0, CSI report not required in that subframe.
- 1, CSI report on Serving cell required.

Returned range when querying the parameter value

Same as previous.

Preset parameter value

Default value is 0 (CSI request disabled).

Programming example

Command form

SET:LTE:RMC:UL:CSI:SFN3 1

Query form

SET:LTE:RMC: UL:CSI:SFN3?

SETup:LTE:RMC:CROSSCHEDuling

Function

This parameter enables activating or deactivating cross scheduling mode for the SCC resources allocation when carrier aggregation is used.

This parameter can only be changed when the LTE/LTE-A network emulation is in the idle state.

Constraints

This setting can only be changed when the system is in the **CELL OFF** state.

Allowed range when setting the parameter value

Two settings are available:

- 0, SCC cross scheduling disabled.
- 1, SCC cross scheduling enabled.

Returned range when querying the parameter value

Same as previous.

Preset parameter value

Default value is 0 (cross scheduling disabled).

Programming example

Command form

SET:LTE:RMC:CROSSCHED 1

Query form

SET:LTE:RMC:CROSSCHED?

SETup<carrier_id#>:LTE:RMC:CQISCHEDuling:STATe

Function

This parameter enables activating or deactivating the CSI based scheduler for each cell.

Constraints

This setting can only be enabled when the CQI/PMI/RI reports are activated in the cell configuration.

Allowed range when setting the parameter value

Two settings are available:

- 0, CSI based scheduler disabled.
- 1, CSI based scheduler enabled.

Returned range when querying the parameter value

Same as previous.

Preset parameter value

Default value is 0 (CSI based scheduler disabled).

Programming example

Command form

SET:LTE:RMC:CQISCHED:STAT 1

Query form

SET:LTE:RMC:CQISCHED:STAT?

SETup<carrier_id#>:LTE:RMC:CQISCHEDuling:PRECODINGMODE

Function

This parameter enables configuring the PMI/RI mode to be used for the CSI based scheduler.

Constraints

This setting can only be changed when the CSI based scheduler is enabled and under certain Transmission Modes.

Allowed range when setting the parameter value

The following table provides the set of values allowed when setting this parameter, and the antenna configuration and transmission modes in which those values are valid:

Static	0	Valid for TM3, TM4 and TM6
Adaptive	1	Valid for TM3, TM4 and TM6
Random	2	Valid for 4x2 TM3, TM4 and TM6

Returned range when querying the parameter value

Same as previous.

Preset parameter value

Default value is 0 (Static).

Programming example

Command form

SET:LTE:RMC:CQISCHED:PRECODINGMODE 0

Query form

SET:LTE:RMC:CQISCHED:PRECODINGMODE?

SETup<carrier_id#>:LTE:RMC:CQISCHEDuling:IMCSCQI<cqi_value#>

Function

This parameter enables configuring the IMCS vs CQI table to be used for the CSI based scheduler, by indicating the IMCS value to be linked to the CQI report indicated in the command.

Constraints

This setting can only be changed when the CSI based scheduler is enabled.

Allowed range when setting the parameter value

The following table provides the set of values allowed when setting this parameter:

MCS Index I_{MCS}	Modulation Order Q_m	TBS Index I_{TBS}
-1	DTX (no allocation)	-
0	QPSK	0
1	QPSK	1
2	QPSK	2

MCS Index I_{MCS}	Modulation Order Q_m	TBS Index I_{TBS}
3	QPSK	3
4	QPSK	4
5	QPSK	5
6	QPSK	6
7	QPSK	7
8	QPSK	8
9	QPSK	9
10	16-QAM	9
11	16-QAM	10
12	16-QAM	11
13	16-QAM	12
14	16-QAM	13
15	16-QAM	14
16	16-QAM	15
17	64-QAM	15
18	64-QAM	16
19	64-QAM	17
20	64-QAM	18
21	64-QAM	19
22	64-QAM	20
23	64-QAM	21
24	64-QAM	22
25	64-QAM	23
26	64-QAM	24
27	64-QAM	25
28	64-QAM	26

Returned range when querying the parameter value

Same as previous.

Preset parameter value

Default value is according to Table A.4-3 in 3GPP TS 36.521-1:

CQI value	IMCS
0	DTX (no allocation)
1	0
2	0
3	2
4	4
5	6
6	8
7	11
8	13
9	16
10	18
11	21
12	23
13	25
14	27
15	27

Programming example

Command form

SET:LTE:RMC:CQISCHED:IMCSCQI4 21

Query form

SET:LTE:RMC:CQISCHED:IMCSCQI4?

8 "HARQ" configuration commands

SETup <carrier_id #>:LTE:HARQ:DL:MAXRETRANSmissions

Function

This parameter enables configuring the maximum number of DL HARQ transmissions that the LTE/LTE-A Network emulator performs before signaling a transmission error to upper layer for each cell.

Constraints

This setting can only be changed when the system is in the **CELL OFF** state.

Allowed range when setting the parameter value

The range of allowed values for this parameter is given in the following table:

1	2	3	4	5	6	7	8	10	12	16	20	24	28

Returned range when querying the parameter value

Same as previous.

Preset parameter value

Default parameter value is 4.

Programming example

Command form

SET1:LTE:HARQ:DL:MAXRETRANS 8

Query form

SET1:LTE:HARQ:DL:MAXRETRANS?

SETup<carrier_id#>:LTE:HARQ:DL:REDUNDancyversionlist

Function

This parameter enables configuring the list of redundancy versions indexes to be used for DL HARQ transmissions in the LTE/LTE-A network emulation for each cell.

Allowed range when setting the parameter value

This command accepts a comma-separated list of 28 values, specifying the redundancy version to be applied to the corresponding transmission. Each value can be 0, 1, 2 or 3.

Returned range when querying the parameter value

Same as previous.

Preset parameter value

Default parameter value is 0, 1, 2, 3, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0..

Programming example

Command form

SET1:LTE:HARQ:DL:REDUND (0,0,1,2,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0)

Query form

SET1:LTE:HARQ:DL:REDUND?

SETup:LTE:HARQ:UL:MAXRETRANSmissions

Function

This parameter enables configuration of the maximum number of UL HARQ transmissions that the LTE/LTE-A network emulator performs before signaling a transmission error to upper layer for each cell.

Allowed range when setting the parameter value

The range of allowed values for this parameter is:

1	2	3	4	5	6	7	8	10	12	16	20	24	28

Returned range when querying the parameter value

Same as previous.

Preset parameter value

Default parameter value is 1.

Programming example

Command form

SET:LTE:HARQ:UL:MAXRETRANS 8

Query form

SET:LTE:HARQ:UL:MAXRETRANS?

SETup:LTE:HARQ:REPORTingmode

Function

This parameter enables configuring the TDD feedback mode.

Constraints

This setting can only be changed when the system is in the **CELL OFF** state, and TDD duplex mode is used.

Allowed range when setting the parameter value

Two settings are available:

- 0, TDD feedback mode configured is Bundling.
- 1, TDD feedback mode configured is Multiplexing.

Returned range when querying the parameter value

Same as previous.

Preset parameter value

Default parameter value is 0 (Bundling mode).

Programming example

Command form

SET:LTE:HARQ:REPORT 1

Query form

SET:LTE:HARQ:REPORT?

9 "Boosting" configuration commands

SETup<carrier_id #>:LTE: BOOSTing:PDSCH:PA

Function

This parameter enables configuring pa from PDSCH for each cell.

Constraints

This setting can only be changed when the system is in the **CELL OFF** state.

Allowed range when setting the parameter value

The following table provides the set of values allowed when setting this parameter:

-6 dB	0
-4.77 dB	1
-3 dB	2
-1.77 dB	3
0 dB	4
1 dB	5
2 dB	6
3 dB	7

Returned range when querying the parameter value

Same as previous.

Preset parameter value

Default parameter value is 0

Programming example

Command form

SET1:LTE:BOOST:PDSCH:PA 1

Query form

SET1:LTE:BOOST:PDSCH:PA

SETup<carrier_id #>:LTE: BOOSTing:PDSCH:PB

Function

This parameter enables configuring pb from PDSCH for each cell.

Constraints

This setting can only be changed when the system is in the **CELL OFF** state.

Allowed range when setting the parameter value

The following table provides the allowed set of values when setting this parameter:

0	1	2	3

Returned range when querying the parameter value

Same as previous.

Preset parameter value

Default p-b values is 0 in SISO or SIMO and 1 in MIMO.

Programming example

Command form

SET1:LTE:BOOST:PDSCH:PB 1

Query form

SET1:LTE:BOOST:PDSCH:PB?

SETup<carrier_id #>:LTE: BOOSTing:PSS:PA

Function

This parameter enables configuring pa from PSS for each cell.

Constraints

This setting can only be changed when the system is in the **CELL OFF** state.

Allowed range when setting the parameter value

The following table provides the set of values allowed when setting this parameter:

-6 dB	0
-4.77 dB	1
-3 dB	2
-1.77 dB	3
0 dB	4
1 dB	5
2 dB	6
3 dB	7

Returned range when querying the parameter value

Same as previous.

Preset parameter value

Default parameter value is 0

Programming example

Command form

SET1:LTE:BOOST:PSS:PA 1

Query form

SET1:LTE:BOOST:PSS:PA?

SETup<carrier_id #>:LTE: BOOSTing:SSS:PA

Function

This parameter enables configuring pa from SSS for each cell.

Constraints

This setting can only be changed when the system is in the **CELL OFF** state.

Allowed range when setting the parameter value

The following table provides the set of values allowed when setting this parameter:

-6 dB	0
-4.77 dB	1
-3 dB	2
-1.77 dB	3
0 dB	4
1 dB	5
2 dB	6
3 dB	7

Returned range when querying the parameter value

Same as previous.

Preset parameter value

Default parameter value is 0

Programming example

Command form

SET1:LTE:BOOST:SSS:PA 1

Query form

SET1:LTE:BOOST:SSS:PA?

SETup<carrier_id #>:LTE: BOOSTing:OTHER:PA

Function

This parameter enables configuring pa from other channels (pcfich, phich and pdcch) for each cell.

Constraints

This setting can only be changed when the system is in the **CELL OFF** state.

Allowed range when setting the parameter value

The following table provides the set of values allowed when setting this parameter:

-6 dB	0
-4.77 dB	1
-3 dB	2
-1.77 dB	3
0 dB	4
1 dB	5
2 dB	6
3 dB	7

Returned range when querying the parameter value

Same as previous.

Preset parameter value

Default parameter value is 0

Programming example

Command form

SET1:LTE:BOOST:OTHER:PA 1

Query form

SET1:LTE:BOOST:OTHER:PA?

SETup<carrier_id #>:LTE: BOOSTing:OTHER:PB

Function

This parameter enables configuring pb from other channels (pcfich, phich and pdcch) for each cell.

Constraints

This setting can only be changed when the system is in the **CELL OFF** state.

Allowed range when setting the parameter value

The following table provides the allowed set of values when setting this parameter:

0	1	2	3

Returned range when querying the parameter value

Same as previous.

Preset parameter value

Default p-b values is 0 in SISO or SIMO and 1 in MIMO.

Programming example

Command form

SET1:LTE:BOOST:OTHER:PB 1

Query form

SET1:LTE:BOOST:OTHER:PB?

10 "Measurements" configuration commands

SETup <carrier_id #>:LTE:MEASREP:CQIPMIRI[:ENABLE]

Function

This parameter enables the enabling/disabling the periodic CSI feedback in the LTE/LTE-A network emulation for each cell.

When enabled, the UE is configured to periodically transmit CQI/PMI/RI reports.

Constraints

This setting can only be changed when the system is in the **CELL OFF** state.

Allowed range when setting the parameter value

The following table provides the allowed set of values when setting this parameter:

CSI Reporting disabled	0
CSI Reporting enabled	1

Returned range when querying the parameter value

Same as previous.

Preset parameter value

Default value is CQI/RI/PMI Reporting disabled (0).

Programming example

Command form

SET1:LTE:MEASREP:CQIPMIRI 1

Query form

SET1:LTE:MEASREP: CQIPMIRI?

SETup <carrier_id #>:LTE:MEASREP:CQIPMIRI:MODE

Function

This parameter enables configuring the aperiodic CSI feedback mode to be used in the LTE/LTE-A network emulation for each cell.

Constraints

This setting can only be changed when the system is in the **CELL OFF** state.

Allowed range when setting the parameter value

The following table provides the allowed set of values when setting this parameter:

Mode 1-0 or Mode 1-1	0
Mode 2-0 or Mode 2-1	1

Returned range when querying the parameter value

Same as previous.

Preset parameter value

Default value is CQI/PMI/RI Reporting Mode 1-0 (0).

Programming example

Command form

SET1:LTE:MEASREP:CQIPMIRI:MODE 1

Query form

SET1:LTE:MEASREP: CQIPMIRI:MODE?

SETup<carrier_id#>:LTE:MEASREP:CQIPMIRI:CQIPMICFGIDX

Function

This parameter enables configuring the CQI/PMI report configuration index to be used in the LTE/LTE-A network emulation for each cell.

Constraints

This setting can only be changed when the system is in the **CELL OFF** state.

Allowed range when setting the parameter value

The following range provides the allowed set of values when setting this parameter: 0 to 1023.

Returned range when querying the parameter value

Same as previous.

Preset parameter value

Default value is 5.

Programming example

Command form

SET1:LTE:MEASREP:CQIPMIRI:CQIPMICFGIDX 0

Query form

SET1:LTE:MEASREP: CQIPMIRI:CQIPMICFGIDX?

SETup <carrier id #>:LTE:MEASREP:CQIPMIRI:RICFGIDX

Function

This parameter enables configuring the RI report configuration index to be used in the LTE/LTE-A network emulation.

Constraints

This setting can only be changed when the system is in the **CELL OFF** state.

Allowed range when setting the parameter value

The following range provides the allowed set of values when setting this parameter: 0 to 1023.

Returned range when querying the parameter value

Same as previous.

Preset parameter value

Default value is 484.

Programming example

Command form

SET1:LTE:MEASREP:CQIPMIRI:RICFGIDX 0

Query form

SET1:LTE:MEASREP:CQIPMIRI:RICFGIDX?

SETup :LTE:MEASREP:APERIODic[:ENABLE]

Function

This parameter allows the enabling/disabling the aperiodic CSI feedback in the LTE/LTE-A network emulation.

Constraints

This setting can only be changed in PCC when the system is in the **CELL OFF** state.

Allowed range when setting the parameter value

The following table provides the allowed set of values when setting this parameter:

Aperiodic CSI Reporting disabled	0
Aperiodic CSI Reporting enabled	1

Returned range when querying the parameter value

Same as previous.

Preset parameter value

Default value is aperiodic CSI Reporting disabled (0).

Programming example

Command form

SET:LTE:MEASREP:APERIOD 1

Query form

SET:LTE:MEASREP:APERIOD?

SETup :LTE:MEASREP:APERIODic:MODE

Function

This parameter enables configuring the aperiodic CSI feedback mode to be used in the LTE/LTE-A network emulation.

Constraints

This setting can only be changed in PCC when the system is in the **CELL OFF** state.

Allowed range when setting the parameter value

The following table provides the allowed set of values when setting this parameter:

Mode 1-2	0
Mode 2-0	1
Mode 2-2	2
Mode 3-0	3
Mode 3-1	4

Returned range when querying the parameter value

Same as previous.

Preset parameter value

Default value is Mode 2-0 (1).

Programming example

Command form

SET:LTE:MEASREP:APERIOD:MODE 1

Query form

SET:LTE:MEASREP:APERIOD:MODE?

SETup:LTE:MEASREP:RSRPRSRQ[:ENABLE]

Function

This parameter allows you to enable/disable the RSRP/RSRQ reporting in the LTE/LTE-A network emulation.

When enabled, the UE is configured to periodically transmit RSRP/RSRQ reports as part of the LTE/LTE-A network emulation attach procedure.

Constraints

This setting can only be changed when the system is in the **CELL OFF** state.

Allowed range when setting the parameter value

The following table provides the allowed set of values when setting this parameter:

RSRP/RSRQ Reporting disabled	0
RSRP/RSRQ Reporting enabled	1

Returned range when querying the parameter value

Same as previous.

Preset parameter value

Default value is RSRP/RSRQ Reporting disabled (0).

Programming example

Command form

SET1:LTE:MEASREP:RSRPRSRQ 1

Query form

SET1:LTE:MEASREP:RSRPRSRQ?

SETup:LTE:MEASREP:RSRPRSRQ:PERIODicity

Function

This parameter enables configuring of the RSRP/RSRQ reporting periodicity when enabled in the LTE/LTE-A network emulation.

Constraints

This setting can only be changed when the system is in the **CELL OFF** state.

Allowed range when setting the parameter value

The following table provides the allowed set of values when setting this parameter:

120 ms	0
240 ms	1
480 ms	2
640 ms	3
1024 ms	4
2048 ms	5
5120 ms	6
10240 ms	7
1 minute	8
6 minutes	9
12 minutes	10
30 minutes	11
60 minutes	12

Returned range when querying the parameter value

Same as previous.

Preset parameter value

Default timer value is 1024 ms.

Programming example

Command form

SET1:LTE:MEASREP:RSRPRSRQ:PERIOD 3

Query form

SET1:LTE:MEASREP:RSRPRSRQ:PERIOD?

SETup:LTE:MEASREP:RSRPRSRQ:RSRPFILTERing

Function

This parameter enables configuring the L3 filtering to be applied to RSRP reports in the LTE/LTE-A network emulation.

Constraints

This setting can only be changed when the system is in the **CELL OFF** state.

Allowed range when setting the parameter value

The following table provides the allowed set of values when setting this parameter:

fc0	0
fc1	1
fc2	2
fc3	3
fc4	4
fc5	5
fc6	6
fc7	7
fc8	8
fc9	9
fc11	10
fc13	11
fc15	12
fc17	13
fc19	14

Returned range when querying the parameter value

Same as previous.

Preset parameter value

Default timer value is fc4 (4).

Programming example

Command form

SET1:LTE:MEASREP:RSRPRSRQ:RSRPFILTER 3

Query form

SET1:LTE:MEASREP:RSRPRSRQ:RSRPFILTER?

SETup:LTE:MEASREP:RSRPRSRQ:RSRQFILTERing

Function

This parameter enables configuring the L3 filtering to be applied to RSRQ reports in the LTE-LTE-A network emulation.

Constraints

This setting can only be changed when the system is in the **CELL OFF** state.

Allowed range when setting the parameter value

The following table provides the allowed set of values when setting this parameter:

fc0	0
fc1	1
fc2	2
fc3	3
fc4	4
fc5	5
fc6	6
fc7	7
fc8	8
fc9	9
fc11	10
fc13	11
fc15	12
fc17	13
fc19	14

Returned range when querying the parameter value

Same as previous.

Preset parameter value

Default timer value is fc15 (412).

Programming example

Command form

SET1:LTE:MEASREP:RSRPRSRQ:RSRQFILTER 3

Query form

SET1:LTE:MEASREP:RSRPRSRQ:RSRQFILTER?

11 "L1 Advanced" configuration commands

SETup <carrier_id #>:LTE:CNTRLREGionconfiguration:CFI

Function

This parameter enables configuring the control region size, in terms of OFDMA symbols that the control region in each DL sub-frame are composed of, for each cell.

Allowed range when setting the parameter value

The range of allowed values are 1, 2, or 3 symbols and does not depend on the bandwidth configuration in use.

Returned range when querying the parameter value

Same as previous.

Preset parameter value

Default parameter value is 1.

Programming example

Command form

SET1:LTE:CNTRLREG:CFI 3

Query form

SET1:LTE:CNTRLREG:CFI?

SETup<carrier_id#>:LTE:CNTRLREGionconfiguration:AGGRegationlevel:COMMonsearchspace

Function

This parameter enables configuring the aggregation level to be used in the common search space of the control region in each DL sub-frame for each cell.

Allowed range when setting the parameter value

The set of allowed values is 4 and 8.

Returned range when querying the parameter value

Same as previous.

Preset parameter value

Default parameter value is 4.

Programming example

Command form

SET1:LTE:CNTRLREG:AGGR:COMM 4

Query form

SET1:LTE:CNTRLREG:AGGR:COMM?

SETup<carrier_id#>:LTE:CNTRLREGionconfiguration:AGGRegationlevel:UEspecificsearchspace

Function

This parameter enables configuring the aggregation level to be used in the UE-specific search space of the control region in each DL sub-frame for each cell.

Allowed range when setting the parameter value

The set of allowed values is 1, 2, 4 and 8.

Returned range when querying the parameter value

Same as previous.

Preset parameter value

Default parameter value is 2.

Programming example

Command form

SET1:LTE:CNTRLREG:AGGR:UE 1

Query form

SET1:LTE:CNTRLREG:AGGT:UE?

SETup <carrier_id#>:LTE:PHICHconfiguration:DURation

Function

This parameter enables configuring the duration of the PHICH channel mapped to control region in each DL sub-frame for each cell.

Constraints

This setting can only be changed when the system is in the **CELL OFF** state.

Allowed range when setting the parameter value

The set of allowed values is given by the following table:

Normal duration	0
Extended duration	1

Returned range when querying the parameter value

Same as previous.

Preset parameter value

Default parameter value is 0 (normal duration).

Programming example

Command form

SET1:LTE:PHICH:DUR 1

Query form

SET1:LTE:PHICH:DUR?

SETup<carrier_id#>:LTE:PHICHconfiguration:RESources

Function

This parameter enables configuring the resources of the PHICH channel mapped to control region in each DL sub-frame for each cell.

Constraints

This setting can only be changed when the system is in the **CELL OFF** state.

Allowed range when setting the parameter value

The set of allowed values is given by the following table:

1/6	0
1/2	1
1	2
2	3

Returned range when querying the parameter value

Same as previous.

Preset parameter value

Default parameter value is 0 (1/6 resource setting).

Programming example

Command form

SET1:LTE:PHICH:RES 1

Query form

SET1:LTE:PHICH:RES?

SETup:LTE:PRACHconfiguration:CFGIDX

Function

This parameter enables configuring the duration configuration index to be used for PRACH.

Constraints

This setting can only be changed when the system is in the **CELL OFF** state.

Allowed range when setting the parameter value

The range of allowed values is 0 to 63.

Returned range when querying the parameter value

Same as previous.

Preset parameter value

Default index value is 3.

Programming example

Command form

SET:LTE:PRACH:CFGIDX 1

Query form

SET:LTE:PRACH:CFGIFX?

SETup:LTE:PRACHconfiguration:ROOTSEQIDX

Function

This parameter enables configuring the root sequence index to be used for PRACH.

Constraints

This setting can only be changed when the system is in the **CELL OFF** state.

Allowed range when setting the parameter value

The range of allowed values is 0 to 837.

Returned range when querying the parameter value

Same as previous.

Preset parameter value

Default index value is 22.

Programming example

Command form

SET:LTE:PRACH:ROOTSEQIDX 1

Query form

SET:LTE:PRACH:ROOTSEQIDX?

SETup:LTE:PRACHconfiguration:FREQOFFset

Function

This parameter enables configuring the frequency offset to be used for PRACH.

Constraints

This setting can only be changed when the system is in the **CELL OFF** state.

Allowed range when setting the parameter value

The range of allowed values is 0 to 94.

Returned range when querying the parameter value

Same as previous.

Preset parameter value

Default parameter value is 0.

Programming example

Command form

SET:LTE:PRACH:FREQOFF 1

Query form

SET:LTE:PRACH:FREQOFF?

SETup:LTE:REFSIGNalsconfiguration:GRPHOPPingenable

Function

This parameter enables configuring the group hopping enable for the cell specific reference signals.

Constraints

This setting can only be changed when the system is in the **CELL OFF** state.

Allowed range when setting the parameter value

The possible values for this parameter are enabled and disabled, as given by the following table:

Disable	0
Enable	1

Returned range when querying the parameter value

Same as previous.

Preset parameter value

Default parameter value is 0 (disable).

Programming example

Command form

SET:LTE:REFSIGN:GRPHOPP 1

Query form

SET:LTE:REFSIGN:GRPHOPP?

SETup:LTE:REFSIGNalsconfiguration:SEQHOPPingenable

Function

This parameter enables configuring the sequence hopping enable for the cell specific reference signals.

Constraints

This setting can only be changed when the system is in the **CELL OFF** state.

Allowed range when setting the parameter value

The possible values for this parameter are enabled and disabled, as given by the following table:

Disable	0
Enable	1

Returned range when querying the parameter value

Same as previous.

Preset parameter value

Default parameter value is 0 (disable).

Programming example

Command form

SET:LTE:REFSIGN:SEQHOPP 1

Query form

SET:LTE:REFSIGN:SEQHOPP?

SETup:LTE:REFSIGNalsconfiguration:CYCLICSHIFT

Function

This parameter enables configuring the cyclic shift to be used for the cell specific reference signals.

Constraints

This setting can only be changed when the system is in the **CELL OFF** state.

Allowed range when setting the parameter value

The allowed range of values for this parameter is 0 to 7.

Returned range when querying the parameter value

Same as previous.

Preset parameter value

Default parameter value is 1.

Programming example

Command form

SET:LTE:REFSIGN:CYCLICSHIFT 0

Query form

SET:LTE:REFSIGN:CYCLICSHIFT?

12 "L2 Advanced" configuration commands

SETup:LTE:RACHconfiguration:NUMPREAMbles

Function

This parameter enables configuring the number of non-dedicated random access preambles for use during the random access procedure.

Constraints

This setting can only be changed when the system is in the **CELL OFF** state.

Allowed range when setting the parameter value

The allowed range of values for this parameter is given by the following table:

4	8	12	16	20	24	28	32	36	40	44	48	52	56	60	64

Returned range when querying the parameter value

Same as previous.

Preset parameter value

Default parameter value is 52.

Programming example

Command form

SET:LTE:RACH:NUMPREAM 16

Query form

SET:LTE:RACH:NUMPREAM?

SETup:LTE:RACHconfiguration:INITRXPWRLEVel

Function

This parameter enables configuring the initial target power level for the random access transmissions from the UE. The units for this parameter are dBm.

Constraints

This setting can only be changed when the system is in the **CELL OFF** state.

Allowed range when setting the parameter value

The allowed range of values for this parameter is given by the following table:

-120 dBm	-118 dBm	-116 dBm	-114 dBm	-112 dBm	-110 dBm	-108 dBm	-106 dBm
-104 dBm	-102 dBm	-100 dBm	-98 dBm	-96 dBm	-94 dBm	-92 dBm	-90 dBm

Returned range when querying the parameter value

Same as previous.

Preset parameter value

Default parameter value is -104 dBm.

Programming example

Command form

SET:LTE:RACH:INITRXPWRLEV -94

Query form

SET:LTE:RACH:INITRXPWRLEV?

SETup:LTE:RACHconfiguration:PWRRAMPSTEP

Function

This parameter enables configuring the power ramping steps for successive transmissions of the random access transmissions from the UE. The units for this parameter are dB.

Constraints

This setting can only be changed when the system is in the **CELL OFF** state.

Allowed range when setting the parameter value

The allowed range of values for this parameter is given by the following table:

0 dB	2 dB	4 dB	6 dB

Returned range when querying the parameter value

Same as previous.

Preset parameter value

Default parameter value is 2 dB.

Programming example

Command form

SET:LTE:RACH:PWRRAMPSTEP 4

Query form

SET:LTE:RACH:PWRRAMPSTEP?

SETup:LTE:RACHconfiguration:MAXPREAMBLETXATTEMPTS

Function

This parameter enables configuring the initial maximum number of random access transmissions attempts to be performed by the UE when no answer is received from the system simulator.

Constraints

This setting can only be changed when the system is in the **CELL OFF** state.

Allowed range when setting the parameter value

The allowed range of values for this parameter is given by the following table:

3	4	5	6	7	8	10	20	50	100	200

Returned range when querying the parameter value

Same as previous.

Preset parameter value

Default parameter value is 6.

Programming example

Command form

SET:LTE:RACH:MAXPREAMBLETXATTEMPTS 100

Query form

SET:LTE:RACH:MAXPREAMBLETXATTEMPTS?

SETup:LTE:RACHconfiguration:RESPWINDOWSIZe

Function

This parameter enables configuring the preamble response window size, in number of sub frames.

Constraints

This setting can only be changed when the system is in the **CELL OFF** state.

Allowed range when setting the parameter value

The allowed range of values for this parameter is given in the following table:

2	3	4	5	6	7	8	10

Returned range when querying the parameter value

Same as previous.

Preset parameter value

Default parameter values is 10 sub frames.

Programming example

Command form

SET:LTE:RACH:RESPWINDOWSIZ 5

Query form

SET:LTE:RACH:RESPWINDOWSIZ?

SETup:LTE:RACHconfiguration:CONTENTIONRESOLTIMer

Function

This parameter enables configuring the random access procedure contention resolution timer vale, in number of sub frames.

Constraints

This setting can only be changed when the system is in the **CELL OFF** state.

Allowed range when setting the parameter value

The allowed range of values for this parameter is given in the following table:

8	16	24	32	40	48	56	64

Returned range when querying the parameter value

Same as previous.

Preset parameter value

Default parameter value is 48 sub frames.

Programming example

Command form

SET:LTE:RACH:CONTENTIONRESOLTIM 24

Query form

SET:LTE:RACH:CONTENTIONRESOLTIM?

SETup:LTE:RACHconfiguration:MSG3MAXHARQRETRANSmission

Function

This parameter enables configuring the maximum number of HARQ retransmissions allowed for the Message 3 during the random access procedure.

Constraints

This setting can only be changed when the system is in the **CELL OFF** state.

Allowed range when setting the parameter value

The allowed range of values for this parameter is 1 to 8.

Returned range when querying the parameter value

Same as previous.

Preset parameter value

Default parameter value is 4.

Programming example

Command form

SET:LTE:RACH:MSG3MAXHARQRETRANS 8

Query form

SET:LTE:RACH:MSG3MAXHARQRETRANS?

SETup:LTE:SRconfiguration:VALue

Function

This parameter enables configuring the value to be used for the Information Element (IE) in which the Scheduling Request (SR) configuration is provided to the UE.

Constraints

This setting can only be changed when the system is in the **CELL OFF** state.

Allowed range when setting the parameter value

The following table provides the range of values allowed for this parameter:

- 0, the SR configuration IE is not transmitted at all.
- 1, the SR configuration IE value is set to "Release". The remaining SR configuration parameters are NOT transmitted.
- 2, the SR configuration IE value is set to "Setup". The remaining SR configuration parameters is transmitted as configured.

Returned range when querying the parameter value

Same as previous.

Preset parameter value

Default parameter value is 2 (Setup).

Programming example

Command form

SET:LTE:SR:VAL 2

Query form

SET:LTE:SR:VAL?

SETup:LTE:SRconfiguration:PUCCHRESIDX

Function

This parameter enables configuring the PUCCH resource that the UE uses when transmitting scheduling requests to the System Simulator (SS).

Constraints

This setting can only be changed when the system is in the **CELL OFF** state.

Allowed range when setting the parameter value

The allowed range for this parameter depends on the actual system bandwidth configured in the emulated LTE cell. The maximum range is 0 to 2047.

Returned range when querying the parameter value

Same as previous.

Preset parameter value

Default parameter value is 39.

Programming example

Command form

SET:LTE:SR:PUCCHRESIDX 5

Query form

SET:LTE:SR:PUCCHRESIDX?

SETup:LTE:SRconfiguration:CFGIDX

Function

This parameter enables configuring the PUCCH configuration index to be used by the UE transmitting SR to the system simulator.

Constraints

This setting can only be changed when the system is in the **CELL OFF** state.

Allowed range when setting the parameter value

The allowed range for this parameter is 0 to 155.

Returned range when querying the parameter value

Same as previous.

Preset parameter value

Default parameter value is 10.

Programming example

Command form

SET:LTE:SR:CFGIDX 5

Query form

SET:LTE:SR:CFGIDX?

SETup:LTE:SRconfiguration:DSRTXMAX

Function

This parameter enables configuring the maximum number of SR transmissions the UE is allowed to perform before switching to a random access procedure, in case the system simulator does not answer to the requests.

Constraints

This setting can only be changed when the system is in the **CELL OFF** state.

Allowed range when setting the parameter value

The allowed range for this parameter is given in the following table:

4	8	16	32	64

Returned range when querying the parameter value

Same as previous.

Preset parameter value

Default parameter value is 4.

Programming example

Command form

SET:LTE:SR:DSRTXMAX 32

Query form

SET:LTE:SR:DSRTXMAX?

SETup:LTE:CRNTI

Function

This parameter enables configuring C-RNTI value to be used for the PDSCH allocations signaled to the UE by the system simulator.

Constraints

This setting can only be changed when the system is in the **CELL OFF** state.

Allowed range when setting the parameter value

The allowed range of values for this parameter is 0x0001 to 0xFFF3.

Returned range when querying the parameter value

Same as previous.

Preset parameter value

Default parameter value is 1.

Programming example

Command form

SET:LTE:CRNTI 5

Query form

SET:LTE:CRNTI?

13 "RRC/NAS" configuration commands

SETup:LTE:TIMERconfiguration:T300

Function

This parameter enables configuring the timer value used to detect a timeout during the RRC connection establishment procedure.

The values used when setting this parameter need to be provided in ms.

Constraints

This setting can only be changed when the system is in the **CELL OFF** state.

Allowed range when setting the parameter value

The following table provides the allowed set of values when setting this parameter:

100 ms	200 ms	300 ms	400 ms	600 ms	1000 ms	1500 ms	2000 ms

Returned range when querying the parameter value

Same as previous.

Preset parameter value

Default timer value is 1000ms.

Programming example

Command form

SET:LTE:TIMER:T300 200

Query form

SET:LTE:TIMER:T300?

SETup:LTE:TIMERconfiguration:T301

Function

This parameter enables configuring the timer value used to detect a timeout during the RRC connection reestablishment procedure.

The values used when setting this parameter need to be provided in ms.

Constraints

This setting can only be changed when the system is in the **CELL OFF** state.

Allowed range when setting the parameter value

The following table provides the allowed set of values when setting this parameter:

100 ms	200 ms	300 ms	400 ms	600 ms	1000 ms	1500 ms	2000 ms

Returned range when querying the parameter value

Same as previous.

Preset parameter value

Default timer value is 1000ms.

Programming example

Command form

SET:LTE:TIMER:T301 300

Query form

SET:LTE:TIMER:T301?

SETup:LTE:TIMERconfiguration:T310

Function

This parameter enables configuring the timer value used to detect a radio link failure.

The values used when setting this parameter need to be provided in ms.

Constraints

This setting can only be changed when the system is in the **CELL OFF** state.

Allowed range when setting the parameter value

The following table provides the allowed set of values when setting this parameter:

200 ms	500 ms	1000 ms	2000 ms

Returned range when querying the parameter value

Same as previous.

Preset parameter value

Default timer value is 1000ms.

Programming example

Command form

SET:LTE:TIMER:T310 200

Query form

SET:LTE:TIMER:T310?

SETup:LTE:TIMERconfiguration:T311

Function

This parameter enables configuring the timer value to be started upon start of the RRC connection reestablishment and stopped upon selection of a suitable EUTRA cell or cell using another RAT.

The values used when setting this parameter need to be provided in ms.

Constraints

This setting can only be changed when the system is in the **CELL OFF** state.

Allowed range when setting the parameter value

The following table provides the allowed set of values when setting this parameter:

1000 ms	3000 ms	5000 ms	10000 ms	15000 ms	20000 ms	30000 ms

Returned range when querying the parameter value

Same as previous.

Preset parameter value

Default timer value is 10000ms.

Programming example

Command form

SET:LTE:TIMER:T311 1000

Query form

SET:LTE:TIMER:T311?

SETup:LTE:CONSTANTconfiguration:N310

Function

This parameter enables configuring the N310 counter value to be used as part of the radio link failure detection algorithm.

Constraints

This setting can only be changed when the system is in the **CELL OFF** state.

Allowed range when setting the parameter value

The following table provides the allowed set of values when setting this parameter:

1	2	3	4	5	6	8	10	20

Returned range when querying the parameter value

Same as previous.

Preset parameter value

Default counter value is 1.

Programming example

Command form

SET:LTE:CONSTANT:N310 5

Query form

SET:LTE:CONSTANT:N310?

SETup:LTE:CONSTANTconfiguration:N311

Function

This parameter enables configuring the N311 counter value to be used as part of the radio link failure detection algorithm.

Constraints

This setting can only be changed when the system is in the **CELL OFF** state.

Allowed range when setting the parameter value

The following table provides the allowed set of values when setting this parameter:

1	2	3	4	5	6	8	10

Returned range when querying the parameter value

Same as previous.

Preset parameter value

Default counter value is 1.

Programming example

Command form

SET:LTE:CONSTANT:N311 6

Query form

SET:LTE:CONSTANT:N311?

SETup:LTE:IP:APN

Function

Set/queries the current value for the access point name (APN) parameter to be transmitted to the UE during the registration procedure.

Constraints

This setting can only be changed when the system is in the **CELL OFF** state.

Allowed range when setting the parameter value

The access point name parameter is provided as an ASCII string, with a minimum length of 1 character and a maximum length of 100 characters.

Returned range when querying the parameter value

Same as previous.

Preset parameter value

Default setting for this parameter is: Agilent.

Programming example

Command form

SET:LTE:IP:APN "Test Network"

Query form

SET:LTE:IP:APN?

SETup:LTE:IP:V4ADDRess

Function

Set/queries the current value for the IPv4 protocol address to be used when assigning an IPv4 address to the UE during the registration procedure.

Note that this happens both when the TA/LA is configured to assign an IPv4 address during registration, and when it is configured to assign both an IPv4 and IPv6 addresses.

Constraints

This setting can only be changed when the system is in the **CELL OFF** state.

Allowed range when setting the parameter value

This parameter takes an ASCII string as value. The ASCII string shall have the following format:

a.b.c.d

where a, b, c and d are integer values in the range of 0 to 255.

NOTE	The TA/LA does not perform any checking of the correctness of the provided IP address. It is your responsibility to ensure that the entered IPv4 address is valid.

Returned range when querying the parameter value

Same as previous.

Preset parameter value

Default setting for this parameter is: "20.20.20.100".

Programming example

Command form

SET:LTE:IP:V4ADDR "192.168.56.45"

Query form

SET:LTE:IP:V4ADDR?

SETup:LTE:SIGNALINGMODE

Function

Sets/queries the signaling mode in the UXM simulator.

Constraints

This setting can only be changed when the system is in the **CELL OFF** state.

Allowed range when setting the parameter value

According to the following table:

0	Signaling mode disabled
1	Signaling mode enabled

Returned range when querying the parameter value

Same as previous.

Preset parameter value

Default parameter value is 1 (signaling mode enabled).

Programming example

Command form

SET:LTE:SIGNALINGMODE 0

Query form

SET:LTE:SIGNALINGMODE?

SETup:LTE:RLF

Function

Sets/queries the Radio Link Failure detection capabilities in the LTE/LTE-A network emulation.

Constraints

This setting can only be changed when the system is in the **CELL OFF** state.

Allowed range when setting the parameter value

The following table provides the allowed set of values for this command:

Radio Link Failure detection disabled	0
Radio Link Failure detection enabled	1

Returned range when querying the parameter value

Same as above.

Preset parameter value

Default parameter value is 0 (Radio Link Failure disabled).

Programming example

Command form

SET:LTE:RLF 1

Query form

SET:LTE:RLF?

14 "Security" configuration commands

SETup:LTE:SECURITYconfiguration:STATe

Function

Sets/queries the current state of the security procedures performed during UE registration to the UXM.

When in disabled state, the system simulator skips the integrity/security related signaling procedures normally performed during UE registration.

When in enabled state, the system simulator executes the integrity/security related procedures as part of the UE network registration procedures.

Constraints

This setting can only be changed when the system is in the **CELL OFF** state.

Allowed range when setting the parameter value

- 0, indicating the integrity/security procedures are disabled.
- 1, indicating the integrity/security procedures are enabled.

Returned range when querying the parameter value

Same as previous.

Preset parameter value

Default setting for this parameter is enabled (1).

Programming example

Command form

SET:LTE:SECURITY:STATE 1

Query form

SET:LTE:SECURITY:STATE?

SETup:LTE:SECURITYconfiguration:AUTHKey

Function

Set/queries the current value of the authentication key to be used during the registration process.

Constraints

This setting can only be changed when the system is in the **CELL OFF** state.

Allowed range when setting the parameter value

The authentication key shall be provided as an ASCII string representing a sequence of bytes, coded using hexadecimal notation.

Returned range when querying the parameter value

Same as previous.

Preset parameter value

Default setting for this parameter is: 00 01 02 03 04 05 06 07 08 09 0A 0B 0C 0D 0E 0F.

Programming example

Command form

SET:LTE:SECURITY:AUTHK "00 01 02 03 04 05 06 07 08 09 0A 0B 0C 0D 0E 0F"

Query form

SET:LTE:SECURITY:AUTHK?

SETup:LTE:SECURITYconfiguration:INTEGrity

Function

Set/queries the currently configured integrity protection algorithm that is used during the connection.

Constraints

This setting can only be changed when the system is in the **CELL OFF** state.

Allowed range when setting the parameter value

The allowed set of values for this parameter is represented in the table below:

Null	0
Snow3G	1

Returned range when querying the parameter value

Same as previous.

Preset parameter value

Default setting for this parameter is: 1 (Snow3G).

Programming example

Command form

SET:LTE:SECURITY:INTEG 1

Query form

SET:LTE:SECURITY:INTEG?

SETup:LTE:SECURITYconfiguration:CIPHering

Function

Sets/queries the currently configured ciphering algorithm that is used during the connection.

Constraints

This setting can only be changed when the system is in the **CELL OFF** state.

Allowed range when setting the parameter value

The allowed set of values for this parameter is represented in the table below:

Null	0

Returned range when querying the parameter value

Same as previous.

Preset parameter value

Default setting for this parameter is: 0 (Null).

Programming example

Command form

SET:LTE:SECURITY:CIPH 0

Query form

SET:LTE:SECURITY:CIPH?

15 "DRB" configuration commands

SETup:LTE:DRB:RLCMode

Function

This command enables setting/querying the RLC mode value.

Constraints

This setting can only be changed when the system is in the **CELL OFF** state.

Allowed range when setting the parameter value

The allowed set of values for this parameter is represented in the table below:

AM	0
UM	1

Returned range when querying the parameter value

Same as previous.

Preset parameter value

Default setting for this parameter is UM (1S).

Programming example

Command form

SET:LTE:DRB:RLCM 1

Query form

SET:LTE:DRB:RLCM?

SETup:LTE:DRB:ID

Function

This command enables setting/querying the DRB identity value.

Constraints

This setting can only be changed when the system is in the **CELL OFF** state.

Allowed range when setting the parameter value

The allowed range of values when setting this parameter is 1 to 32.

Returned range when querying the parameter value

Same as previous.

Preset parameter value

The default DRB identity value is 3.

Programming example

Command form

SET1:LTE:DRB:ID 12

Query form

SET1:LTE:DRB:ID?

SETup:LTE:DRB:UM:TREordering

Function

This command enables setting/querying the T-Reordering value, when RLC mode is UM.

Constraints

This setting can only be changed when the system is in the **CELL OFF** state.

Allowed range when setting the parameter value

The allowed set of values for this parameter is represented in the table below:

0	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75
80	85	90	95	100	110	120	130	140	150	160	170	180	190	200	

Returned range when querying the parameter value

Same as previous.

Preset parameter value

The default T-Reordering value is 50.

Programming example

Command form

SET:LTE:DRB:UM:TRE 10

Query form

SET:LTE:DRB:UM:TRE?

SETup:LTE:DRB:AM:TREordering

Function

This command enables setting/querying the T-Reordering value, when RLC mode is AM.

Constraints

This setting can only be changed when the system is in the **CELL OFF** state.

Allowed range when setting the parameter value

The allowed set of values for this parameter is represented in the table below:

0	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75
80	85	90	95	100	110	120	130	140	150	160	170	180	190	200	

Returned range when querying the parameter value

Same as previous.

Preset parameter value

The default T-Reordering value is 50.

Programming example

Command form

SET:LTE:DRB:AM:TRE 5

Query form

SET:LTE:DRB:AM:TRE?

SETup:LTE:DRB:AM: TSPRohibit

Function

This command enables setting/querying the T-Status Prohibit value, when RLC mode is AM.

Constraints

This setting can only be changed when the system is in the **CELL OFF** state.

Allowed range when setting the parameter value

The allowed set of values for this parameter is represented in the table below:

0	5	10	15	20	25	30	35	40	45	50	55	60	65	70
75	80	85	90	95	100	105	110	115	120	125	130	135	140	145
150	155	160	165	170	175	180	185	190	195	200	205	210	215	220
225	230	235	240	245	250	255	300	350	400	450	500			

Returned range when querying the parameter value

Same as previous.

Preset parameter value

The default Status Prohibit value is 50.

Programming example

Command form

SET:LTE:DRB:AM:TSPR 20

Query form

SET:LTE:DRB:AM:TSPR?

SETup:LTE:DRB:AM: TPRetransmit

Function

This command enables setting/querying the T-Poll Retransmit value, when RLC mode is AM.

Constraints

This setting can only be changed when the system is in the **CELL OFF** state.

Allowed range when setting the parameter value

The allowed set of values for this parameter is represented in the table below:

5	10	15	20	25	30	35	40	45	50	55	60	65	70
75	80	85	90	95	100	105	110	115	120	125	130	135	140
145	150	155	160	165	170	175	180	185	190	195	200	205	210
215	220	225	230	235	240	245	250	300	350	400	450	500	

Returned range when querying the parameter value

Same as previous.

Preset parameter value

The default T-Poll Retransmit value is 150.

Programming example

Command form

SET:LTE:DRB:AM:TPR 15

Query form

SET:LTE:DRB:AM:TPR?

SETup:LTE:DRB:AM: PPDU

Function

This command enables setting/querying the Poll PDU value, when RLC mode is AM.

Constraints

This setting can only be changed when the system is in the **CELL OFF** state.

Allowed range when setting the parameter value

The allowed set of values for this parameter is represented in the table below:

p4	0
p8	1
p16	2
p32	3
p64	4
p128	5
p256	6
pInfinity	7

Returned range when querying the parameter value

Same as previous.

Preset parameter value

The default T-Poll PDU value is p32.

Programming example

Command form

SET:LTE:DRB:AM:PPDU 2

Query form

SET:LTE:DRB:AM:PPDU?

SETup:LTE:DRB:AM: PBYTe

Function

This command enables setting/querying the Poll Byte value, when RLC mode is AM.

Constraints

This setting can only be changed when the system is in the **CELL OFF** state.

Allowed range when setting the parameter value

The allowed set of values for this parameter is represented in the table below:

25	0
50	1
75	2
100	3
125	4
250	5
375	6
500	7
750	8
1000	9
1250	10
1500	11
2000	12
3000	13
infinity	14

Returned range when querying the parameter value

Same as previous.

Preset parameter value

The default T-Poll Byte value is 125.

Programming example

Command form

SET:LTE:DRB:AM:PBYT 3

Query form

SET:LTE:DRB:AM:PBYT?

SETup: LTE:DRB:AM: MRTHreshold

Function

This command enables setting/querying the Maximun Retransmission Threshold value, when RLC mode is AM.

Constraints

This setting can only be changed when the system is in the **CELL OFF** state.

Allowed range when setting the parameter value

The allowed set of values for this parameter is represented in the table below:

t1	0
t2	1
t3	2
t4	3
t6	4
t8	5
t16	6
t32	7

Returned range when querying the parameter value

Same as previous.

Preset parameter value

The default value for the Maximun Retransmission Threshold value is t4.

Programming example

Command form

SET:LTE:DRB:AM:MRTH 2

Query form

SET:LTE:DRB:AM:MRTH?

16 "SYSTEM" configuration commands

SETup <carrier_id#>:SYSTem:RFCONNection:DUPlex

Function

This command enables setting/querying the configured operational mode in the E7515A's RF combination unit for each cell.

Constraints

This setting can only be changed when the system is in the **CELL OFF** state.

Allowed range when setting the parameter value

Two settings are available:

- 0, transmission and reception ports are configured on different RF connectors (Tx1 and Tx/Rx connector).
- 1, transmission and reception ports are configured on the same RF connector (Tx/Rx connector).

Returned range when querying the parameter value

Same as previous.

Preset parameter value

By default, the system is set to combined transmission/reception.

Programming example

Command form

SET1:SYST:RFCONN:DUP 1

Query form

SET1:SYST:RFCONN:DUP?

SETup<carrier_id#>:SYSTem:RFCONNection:CORRections:TX1:FREQuency

Function

This command sets/queries a set of comma-separated frequency values (MHz). Each frequency point is paired to an amplitude correction value to be used to account for the losses introduced by the RF cable in TX1 connector for each cell.

Setting a null list (no values) resets the list and sets the state of all frequencies to OFF.

Constraints

This setting can only be changed when the system is in the **CELL OFF** state.

Allowed range when setting the parameter value

The range of frequencies that can be entered for each element of the list corresponds to the range of frequencies supported by theE7515A (300 MHz to 3 GHz, in 10 Hz steps).

They shall be entered as a string containing a comma-separated set of numeric values.

Returned range when querying the parameter value

Same as previous.

Preset parameter value

By default, the list of frequency values is empty.

Programming example

Command form

SET1:SYST:RFCONN:CORR:TX1:FREQ (2198.1,2200.1,2202.1)

Query form

SET1:SYST:RFCONN:CORR:TX1:FREQ?

SETup<carrier_id#>:SYSTem:RFCONNection:CORRections:TX1:AMPOFFset

Function

This command sets/queries a set of comma-separated amplitude correction values (dB). Each amplitude correction value is paired to a frequency point to be used to account for the losses introduced by the RF cable in TX1 connector for each cell.

Setting a null list (no values) resets the list and sets the state of all frequencies to OFF.

Constraints

This setting can only be changed when the system is in the **CELL OFF** state.

Allowed range when setting the parameter value

The range of amplitude correction values that can be entered for each element of the list corresponds is 0 to 100dB in 0.01 dB steps.

They shall be entered as a string containing a comma-separated set of numeric values.

Returned range when querying the parameter value

Same as previous.

Preset parameter value

By default, the list of amplitude correction values is empty.

Programming example

Command form

SET1:SYST:RFCONN:CORR:TX1:AMPOFF (13.2,13.5,13)

Query form

SET1:SYST:RFCONN:CORR:TX1:AMPOFF?

SETup<carrier_id#>:SYSTem:RFCONNection:CORRections:TX1:STATe

Function

This command sets/queries the state of the amplitude correction function for TX1 connector for each cell.

In order to command the application of the amplitude correction factors, you must previously enter the frequency/amplitude correction values that wish for the system to apply.

Constraints

This setting can only be changed when the system is in the **CELL OFF** state.

Allowed range when setting the parameter value

This parameter can take two values:

- 0, amplitude correction factors are not applied.
- 1, amplitude correction factors you enter are applied. Linear interpolation is used for the frequencies not specified by you.

Returned range when querying the parameter value

Same as previous.

Preset parameter value

By default, the amplitude correction factors are not applied.

Programming example

Command form

SET1:SYST:RFCONN:CORR:TX1:STAT 1

Query form

SET1:SYST:RFCONN:CORR:TX1:STAT?

SETup<carrier_id#>:SYSTem:RFCONNection:CORRections:TX2:FREQuency

Function

This command sets/queries a set of comma-separated frequency values (MHz). Each frequency point is paired to an amplitude correction value to be used to account for the losses introduced by the RF cable in TX2 connector for each cell.

Setting a null list (no values) resets the list a sets the state of all frequencies to OFF.

Constraints

This setting can only be changed when the system is in the **CELL OFF** state.

Allowed range when setting the parameter value

The range of frequencies that can be entered for each element of the list corresponds to the range of frequencies supported by the E7515A (300 MHz to 3 GHz, in 10 Hz steps).

They shall be entered as a string containing a comma-separated set of numeric values.

Returned range when querying the parameter value

Same as previous.

Preset parameter value

By default, the list of frequency values is empty.

Programming example

Command form

SET1:SYST:RFCONN:CORR:TX2:FREQ (2198.1,2200.1,2202.1)

Query form

SET1:SYST:RFCONN:CORR:TX2:FREQ?

SETup<carrier_id#>:SYSTem:RFCONNection:CORRections:TX2:AMPOFFset

Function

This command sets/queries a set of comma-separated amplitude correction values (dB). Each amplitude correction value is paired to a frequency point to be used to account for the losses introduced by the RF cable in TX2 connector for each cell.

Setting a null list (no values) resets the list and sets the state of all frequencies to OFF.

Constraints

This setting can only be changed when the system is in the **CELL OFF** state.

Allowed range when setting the parameter value

The range of amplitude correction values that can be entered for each corresponding element of the list is 0 to 100 dB, in 0.01 dB steps.

They must be entered as a string containing a comma-separated set of numeric values.

Returned range when querying the parameter value

Same as previous.

Preset parameter value

By default, the list of amplitude correction values is empty.

Programming example

Command form

SET1:SYST:RFCONN:CORR:TX2:AMPOFF (13.2,13.5,13)

Query form

SET1:SYST:RFCONN:CORR:TX2:AMPOFF?

SETup<carrier_id#>:SYSTem:RFCONNection:CORRections:TX2:STATe

Function

This command sets/queries the state of the amplitude correction function for TX2 connector for each cell.

In order to command the application of the amplitude correction factors, you must previously enter the frequency/amplitude correction values that you wish for the system to apply.

Constraints

This setting can only be changed when the system is in the **CELL OFF** state.

Allowed range when setting the parameter value

This parameter can take two values:

- 0, amplitude correction factors are not applied.
- 1, amplitude correction factors you enter are applied. Linear interpolation is used for the frequencies not specified by you.

Returned range when querying the parameter value

Same as previous.

Preset parameter value

By default, the amplitude correction factors are not applied.

Programming example

Command form

SET1:SYST:RFCONN:CORR:TX2:STAT 1

Query form

SET1:SYST:RFCONN:CORR:TX2:STAT?

SETup<carrier_id#>:SYSTem:RFCONNection:CORRections:TXRX:FREQuency

Function

This command sets/queries a set of comma-separated frequency values (MHz). Each frequency point is paired to an amplitude correction value to be used to account for the losses introduced by the RF cable in TX/RX connector for each cell.

Setting a null list (no values) resets the list a sets the state of all frequencies to OFF.

Constraints

This setting can only be changed when the system is in the **CELL OFF** state.

Allowed range when setting the parameter value

The range of frequencies that can be entered for each element of the list corresponds to the range of frequencies supported by the UXM (300 MHz to 3/6 GHz, in 10 Hz steps).

They must be entered as a string containing a comma-separated set of numeric values.

Returned range when querying the parameter value

Same as previous.

Preset parameter value

By default, the list of frequency values is empty.

Programming example

Command form

SET1:SYST:RFCONN:CORR:TXRX:FREQ (2198.1,2200.1,2202.1)

Query form

SET1:SYST:RFCONN:CORR:TXRX:FREQ?

SETup<carrier_id#>:SYSTem:RFCONNection:CORRections:TXRX:AMPOFFset

Function

This command sets/queries a set of comma-separated amplitude correction values (dB). Each amplitude correction value is paired to a frequency point to be used to account for the losses introduced by the RF cable in TX/RX connector for each cell.

Setting a null list (no values) resets the list a sets the state of all frequencies to OFF.

Constraints

This setting can only be changed when the system is in the **CELL OFF** state.

Allowed range when setting the parameter value

The range of amplitude correction values that can be entered for each corresponding element of the list is -50 to 50 dB, in 0.01 dB steps.

They must be entered as a string containing a comma-separated set of numeric values.

Returned range when querying the parameter value

Same as previous.

Preset parameter value

By default, the list of amplitude correction values is empty.

Programming example

Command form

SET1:SYST:RFCONN:CORR:TXRX:AMPOFF (13.2,13.5,13)

Query form

SET1:SYST:RFCONN:CORR:TXRX:AMPOFF?

SETup<carrier_id#>:SYSTem:RFCONNection:CORRections:TXRX:STATe

Function

This command sets/queries the state of the amplitude correction function for TX/RX connector for each cell.

In order to command the application of the amplitude correction factors, you must have previously entered the frequency/amplitude correction values that you wish the system to apply.

Constraints

This setting can only be changed when the system is in the **CELL OFF** state.

Allowed range when setting the parameter value

This parameter can take two values:

- 0, amplitude correction factors are not applied.
- 1, amplitude correction factors you enter are applied. Linear interpolation is used for the frequencies not specified by you.

Returned range when querying the parameter value

Same as previous.

Preset parameter value

By default, the amplitude correction factors are not applied.

Programming example

Command form

SET1:SYST:RFCONN:CORR:TXRX:STAT 1

Query form

SET1:SYST:RFCONN:CORR:TXRX:STAT?

SETup<carrier_id#>:LTE:MULTANTennaconfiguration

Function

This parameter enables configuring the multiple antenna configurations to be used by the LTE network emulation for each cell.

Constraints

This setting can only be changed when the system is in the **CELL OFF** state.

Allowed range when setting the parameter value

The following table provides the set of values allowed when setting this parameter:

1x1	0
1x2	1
2x2	2
4x2	3

Returned range when querying the parameter value

Same as previous.

Preset parameter value

Default multi-antenna configuration is 1x1 (0).

Programming example

Command form

SET1:LTE:MULTANT 2

Query form

SET1:LTE:MULTANT?

17 "CHANNEL IMPAIRMENTS" configuration commands

SETup<carrier_id#>:LTE:IMPAIRments:AWGN:STATe

Function

This command sets/queries the state of the AWGN generation in the LTE/LTE-A network emulation for each cell.

You are expected to first configure the AWGN interferer noise level to be generated, then activate/deactivate the AWGN generation.

Constraints

None.

Allowed range when setting the parameter value

This parameter can have the following values:

- 0, the AWNG generation is disabled.
- 1, the AWGN generation is enabled.

Returned range when querying the parameter value

Same as previous.

Preset parameter value

By default the AWGN generation is disabled (0).

Programming example

Command form

SET1:LTE:IMPAIR:AWGN:STAT 1

Query form

SET1:LTE:IMPAIR:AWGN:STAT?

SETup<carrier_id #>:LTE:IMPAIRments:AWGN:POWLVL

Function

This command enables you to configure the power level of the AWGN interferer that is added to the generated LTE/LTE-A signal for each cell.

You need to set the value of the interferer level prior to enabling the AWGN interferer generation.

Constraints

This command must be issued before enabling the AWGN interferer generation.

Allowed range when setting the parameter value

The range of allowed values for this parameter depends upon cell configuration.

Returned range when querying the parameter value

As configured by the set form of the command.

Preset parameter value

-41.04 dBm/15kHz.

Programming example

Command form

SET1:LTE:IMPAIR:AWGN:POWLVL -85.6

Query form

SET1:LTE:IMPAIR:AWGN:POWLVL?

SETup<carrier_id#>:LTE:IMPAIRments:FADER:STATe

Function

This command enables you to enable/disable the internal fading channel emulator, as well as the channel model to be applied, for each cell.

Constraints

None.

Allowed range when setting the parameter value

The following values can be used when using this command:

- 0, integrated fading channel emulator is disabled;
- 1, integrated fading channel emulator is set to emulate 3GPP EPA5 channel model;
- 2, integrated fading channel emulator is set to emulate 3GPP EVA5 channel model;
- 3, integrated fading channel emulator is set to emulate 3GPP EVA70 channel model;
- 4, integrated fading channel emulator is set to emulate 3GPP ETU70 channel model;
- 5, integrated fading channel emulator is set to emulate 3GPP ETU300 channel model;
- 6, integrated fading channel emulator is set to emulate 3GPP HST channel model
- 7, integrated fading channel emulator is set to emulate 3GPP CQI channel model

Returned range when querying the parameter value

Same as previous.

Preset parameter value

By default, the integrated fading channel emulator in the TA/LA is disabled (0).

Programming example

Command form

SET1:LTE:IMPAIR:FADER:STAT 1

Query form

SET1:LTE:IMPAIR:FADER:STAT?

SETup<carrier_id#>:LTE:IMPAIRments:FADER:CORRELATIONmode

Function

This command enables you to configure the correlation mode for the internal fading channel emulator for each cell. You need to first configure the internal fading channel emulator in order for you to be able to configure the correlation mode.

Constraints

This setting can only be changed when the integrated fading channel emulator is enabled.

Allowed range when setting the parameter value

The following values can be used when using this command:

- 0, to set the correlation mode to Low;
- 1, to set the correlation mode to Medium;
- 2, to set the correlation mode to High;

Returned range when querying the parameter value

Same as previous.

Preset parameter value

By default, the correlation mode in the TA/LA is low (0).

Programming example

Command form

SET1:LTE:IMPAIR:FADER:CORRELATION 1

Query form

SET1:LTE:IMPAIR:FADER:CORRELATION?

SETup<carrier_id#>: LTE:IMPAIRments:OCNG:STATe

Function

This command set/queries the state of the OCNG Interferer Configuration in the LTE/LTE-A network emulation for each cell.

Constraints

None.

Allowed range when setting the parameter value

This parameter can have the following values:

- 0, the OCNG generation is disabled.
- 1, the OCNG generation is enabled.

Returned range when querying the parameter value

Same as previous.

Preset parameter value

By default the AWGN generation is disabled (0).

Programming example

Command form

SET1:LTE:IMPAIR:OCNG:STAT 1

Query form

SET1:LTE:IMPAIR:OCNG:STAT?

18 "POWER CONTROL" configuration commands

CNTRL:LTE:CONNECTion:UL:ULPOWer

Function

This function enables you to specify the target UL power level that the UE uses, commanded by means of the use of TPC commands. This function is intended to be used together with the function CNTRL:LTE:CONNECTion:UL:TPCCTRL.

Allowed range when setting the parameter value

You can specify a value within the range -40.00 to 30.00 dBm.

Returned range when querying the parameter value

Same as previous.

Preset parameter value

Default parameter value is -10 dBm

Programming example

Command form

CNTRL:LTE:CONNECT:UL:ULPOW 10

Query form

CNTRL:LTE:CONNECT:UL:ULPOW?

CNTRL:LTE:CONNECTion:UL:TPCCTRL

Function

This function commands the LTE/LTE-A Network Emulator to initiate the transmission of TPC commands to the UE, commanding it to modify its transmission power.

Allowed range when setting the parameter value

According to the following table:

0	Disables the transmission of TPC commands
1	System continuously transmits TPC commands to increase the UE transmit power
2	System continuously transmits TPC commands to decrease the UE transmit power
3	System transmits TPC commands as needed to maintain the UE transmit power to the setting specified with the command CNTRL:LTE:CONNECTion:UL:ULPOWer.

Returned range when querying the parameter value

Same as previous.

Preset parameter value

Default parameter value is 0 (no TPC commands are transmitted to the UE).

Programming example

Command form

CNTRL:LTE:CONNECT:UL:TPCCTRL 1

Query form

CNTRL:LTE:CONNECT:UL:TPCCTRL?

19 OPERATION COMMANDS

CNTRL:LTE:BCAST:STATe

Function

Sets/queries the broadcast transmission state in the TA/LA. When broadcast transmission is enabled, the LTE/LTE-A Network Emulator is left in a state in which it can accept incoming ATTACH requests from the UE (signaling mode enabled).

Allowed range when setting the parameter value

According to the following table:

0	Broadcast transmission is disabled
1	Broadcast transmission is enabled

Returned range when querying the parameter value

Same as previous.

Preset parameter value

Default parameter value is 0 (broadcast transmission is disabled).

Programming example

Command form

CNTRL:LTE:BCAST:STAT 1

Query form

CNTRL:LTE:BCAST:STAT?

CNTRL:LTE:ATTACH:STATe

Function

Queries the UE ATTACH state in the TA/LA. In the signaling enabled mode, this command is used to check if the UE attach procedure (and additionally the RRC Reconfiguration procedure, in the case that Carrier Aggregation or CSI-RS activation are enabled) has been completed successfully.

Allowed range when setting the parameter value

None, this command does not accept input parameters.

Returned range when querying the parameter value

According to the following table:

0	The UE is currently not attached to the UXM BSE simulator or there has been an error in the RRC Reconfiguration procedure.
1	The UE is currently attached to the UXM base station emulator, and SCC and/or CSI-RS configuration have been performed successfully.

Preset parameter value

Default parameter value is 0.

Programming example

Command form

Not applicable

Query form

CNTRL:LTE:ATTACH:STAT?

CNTRL:LTE:CONNECTion:DL:STATe

Function

Sets/queries the DL connection status between the UE and the base station emulator. In the signaling enabled mode, this command can be used to check if the UE is currently being allocated DL grants in the PDCCH or to trigger the start of these allocations.

Constraints

This setting can only be changed once the UE has finished the attach process to the cell.

Allowed range when setting the parameter value

According to the following table:

0	Stops the allocation of DL BW grants to the UE in the PDCCH
1	Starts the allocation of DL BW grants to the UE in the PDCCH

Returned range when querying the parameter value

Same as previous.

Preset parameter value

Default parameter value is 0.

Programming example

Command form

CNTRL:LTE:CONNECT:DL:STAT 1

Query form

CNTRL:LTE:CONNECT:DL:STAT?

CNTRL:LTE:CONNECTion:UL:STATe

Function

Sets/queries the UL connection status between the UE and the base station emulator. In the signaling enabled mode, this command can be used to check if the UE is currently being allocated UL grants in the PDCCH or to trigger the start of these allocations.

Constraints

This setting can only be changed once the UE has finished the attach process to the cell.

Allowed range when setting the parameter value

According to the following table:

0	Stops the allocation of UL BW grants to the UE in the PDCCH
1	Starts the allocation of UL BW grants to the UE in the PDCCH

Returned range when querying the parameter value

Same as previous.

Preset parameter value

Default parameter value is 0.

Programming example

Command form

CNTRL:LTE:CONNECT:UL:STAT 1

Query form

CNTRL:LTE:CONNECT:UL:STAT?

CNTRL:LTE:ACTIVATESCC:STATe

Function

Sets/queries the SCC activation configuration for the UE when Carrier Aggregation is configured. That activation can only be done when the UE is already attached to PCC and RRC Reconfiguration for Carrier Aggregation has been successfully performed.

Constraints

This setting can only be changed when Carrier Aggregation is enabled and the UE is already registered to the PCC (or the cell is activated in the case where non-signaling mode is used). For example, this setting can only be changed when the SCC is in "CellON" state.

Allowed range when setting the parameter value

According to the following table:

0	SCC is deactivated
1	SCC is activated

Returned range when querying the parameter value

Same as previous.

Preset parameter value

Default parameter value is 0.

Programming example

Command form

CNTRL:LTE:ACTIVATESCC:STAT 1

Query form

CNTRL:LTE:ACTIVATESCC:STAT?

SETup:LTE:RMC:BlindHandOver

Function

This function enables you to change DL frequency, UL frequency and Cell Id dynamically, while the cell is activated.

You need to first configure the frequency and Cell Id to be applied, then send Blind HO command.

Allowed range when setting the parameter value

None, this command does not accept input parameters nor query form.

Returned range when querying the parameter value

According to the following table:

0	Blind HO has failed
1	Blind HO has finished successfully

Preset parameter value

Not applicable

Programming example

Command form

SET:LTE:RMC:BHO

Query form

SET:LTE:RMC:BHO?

SETup :LTE:RMC:SCCRECONFiguration

Function

This function enables you to change DL frequency, UL frequency and Cell Id dynamically, while the cell is activated. You need to first configure the frequency and Cell Id, then send the Blind HO command to be applied.

Activating the Blind HO command can only be done when the UE is already attached to PCC and RRC Reconfiguration for Carrier Aggregation has been successfully performed.

Constraints

This setting can only be applied when Carrier Aggregation is enabled and the UE is already registered to the PCC (or the cell is activated in the case where non-signaling mode is used). For example, this setting can only be changed when the SCC is in "CellON" state.

Allowed range when setting the parameter value

None, this command does not accept input parameters nor query form.

Returned range when querying the parameter value

According to the following table:

0	SCC Reconfiguration has failed
1	SCC Reconfiguration has finished successfully

Preset parameter value

Not applicable

Programming example

Command form

SET:LTE:RMC:SCCRECONF

Query form

SET:LTE:RMC:SCCRECONF?

20 TX MEASUREMENTS commands

READ:LTE:MEASure:CONSTellation:EVMagnitude?

Function

This function triggers the system to perform a capture of the UL signal transmitted by the UE, followed by the demodulation of the captured signal, assuming it is a valid LTE/LTE-A transmission, and reports several EVM values obtained from the demodulated signal.

The different EVM values obtained by this function are:

- Average EVM calculated on the PUSCH channel for slot 1
- Average EVM calculated on the PUSCH channel for slot 2
- Average EVM calculated on the PUCCH channel for slot 1
- Average EVM calculated on the PUCCH channel for slot 2
- Average EVM calculated on the DMRS signal for slot 1
- Average EVM calculated on the DMRS signal for slot 2

These values are returned by this function as a comma-separated list of values, appearing in the same order as the list provided above.

Allowed range when setting the parameter value

Not applicable, this command only provides a query format.

Returned range when querying the parameter value

Each EVM value is reported as decimal number in the range of 0.00% to 100.00%, following the order specified in 0.

Preset parameter value

Not applicable

Programming example

Command form

Not applicable

Query form

READ:LTE:MEAS:CONST:EVM?

READ:LTE:MEASure:FRQERRor?

Function

This function triggers the system to perform a capture of the UL signal transmitted by the UE, followed by the demodulation of the captured signal, assuming it is a valid LTE/LTE-A transmission, and reports the frequency error obtained from the demodulated signal.

Allowed range when setting the parameter value

Not applicable, this command only provides a query format.

Returned range when querying the parameter value

The frequency error value is reported as a value measured in Hz.

Preset parameter value

Not applicable

Programming example

Command form

Not applicable

Query form

READ:LTE:MEAS:FRQERR?

READ:LTE:MEASure:CONSTellation:IQOFFset?

Function

This function triggers the system to perform a capture of the UL signal transmitted by the UE, followed by the demodulation of the captured signal, assuming it is a valid LTE/LTE-A transmission, and reports the IQ offset obtained from the demodulated signal for both slot 1 and 2, as a comma-separated list of values.

Allowed range when setting the parameter value

Not applicable, this command only provides a query format.

Returned range when querying the parameter value

The IQ offset value is reported as a value measured in dB.

Preset parameter value

Not applicable

Programming example

Command form

Not applicable

Query form

READ:LTE:MEAS:CONST:IQOFF?

READ:LTE:MEASure:CONSTellation:EVMVSSYMBol?

Function

This function triggers the system to perform a capture of the UL signal transmitted by the UE, followed by the demodulation of the captured signal, assuming it is a valid LTE transmission, and reports several EVM values obtained from the demodulated signal.

This function returns EVM measurements results in terms of LTE signal symbols.

These values are returned by this function as a comma-separated list of values, appearing in the same order as the list provided in the *Returned range when querying the parameter value* section, below.

Allowed range when setting the parameter value

Not applicable, this command only provides a query format.

Returned range when querying the parameter value

This function returns the following values:

- Average EVM value over the LTE sub frame symbols, as a percentage value with two decimal positions.
- Peak EVM value over the LTE sub frame symbols, as a percentage value with two decimal positions.
- Symbol index corresponding to the peak EVM measurement within the sub frame, as an integer in the range from 0 to 6.

Preset parameter value

Not applicable

Programming example

Command form

Not applicable

Query form

READ:LTE:MEAS:CONST:EVMVSSYMB?

READ:LTE:MEASure:CONSTellation:EVMVSCARRier?

Function

This function triggers the system to perform a capture of the UL signal transmitted by the UE, followed by the demodulation of the captured signal, assuming it is a valid LTE transmission, and reports several EVM values obtained from the demodulated signal.

The function returns EVM measurements results in terms of LTE OFDM carriers.

These values are returned by this function as a comma-separated list of values, appearing in the same order as the list provided in the *Returned range when querying the parameter value* section, below.

Allowed range when setting the parameter value

Not applicable, this command only provides a query format.

Returned range when querying the parameter value

This function returns the following values:

- Average EVM value over the LTE OFDM subcarriers, as a percentage value with two decimal positions.
- Peak EVM value over the LTE OFDM subcarriers, as a percentage value with two decimal positions.
- Subcarrier index corresponding to the peak EVM measurement, as an integer in the range from 0 to 2047.

Preset parameter value

Not applicable

Programming example

Command form

Not applicable

Query form

READ:LTE:MEAS:CONST:EVMVSCARR?

SETup:LTE:MEASure:OBW

Function

This function enables you to configure the percentage of channel energy that is considered for the calculation of the occupied bandwidth of the captured LTE UL signal when calling the corresponding measurement function.

Allowed range when setting the parameter value

This parameter can be configured as a percentage value between 0.10% and 99.90%.

Returned range when querying the parameter value

Same as previous.

Preset parameter value

The default value for this parameter is 99.90%.

Programming example

Command form

SET:LTE:MEAS:OBW 95

Query form

SET:LTE:MEAS:OBW?

READ:LTE:MEASure:OBW?

Function

This function triggers the system to perform a capture of the UL signal transmitted by the UE and then, assuming it is a valid LTE transmission, reports the bandwidth occupied by the captured signal.

Allowed range when setting the parameter value

Not applicable, this command only provides a query format.

Returned range when querying the parameter value

The occupied bandwidth measurement reports the following parameters:

- Calculated channel occupied bandwidth, as a value in MHz with four decimal positions.
- Calculated channel centroid, as a value in MHz with four decimal positions.
- Minimum calculated channel frequency, as a value in MHz with four decimal positions.
- Maximum calculated channel frequency, as a value in MHz with four decimal positions.

The values are returned in the form of a list in the same order as they appear in the list above.

Preset parameter value

Not applicable

Programming example

Command form

Not applicable

Query form

READ:LTE:MEAS:OBW?

READ:LTE:MEASure:SFLatness?

Function

This function triggers the system to perform a capture of the UL signal transmitted by the UE, followed by the demodulation of the signal, assuming it is a valid LTE transmission and then reports the calculated spectral flatness (maximum difference between highest and lowest OFDM subcarrier within the complete channel bandwidth).

Allowed range when setting the parameter value

Not applicable, this command only provides a query format.

Returned range when querying the parameter value

The maximum absolute carrier difference is reported as a value in dB with two decimal positions.

Preset parameter value

Not applicable

Programming example

Command form

Not applicable

Query form

READ:LTE:MEAS:SFL?

READ:LTE:MEASure:CHPOWer?

Function

This function triggers the system to perform a capture of the UL signal transmitted by the UE and then, assuming it is a valid LTE transmission, reports the channel power of the captured signal.

Allowed range when setting the parameter value

Not applicable, this command only provides a query format.

Returned range when querying the parameter value

The channel power is reported as a value in dBm, with two decimal positions.

Preset parameter value

Not applicable

Programming example

Command form

Not applicable

Query form

READ:LTE:MEAS:CHPOW?

READ:LTE:MEASure:PAPR?

Function

This function triggers the system to perform a capture of the UL signal transmitted by the UE and then, assuming it is a valid LTE transmission, reports the PAPR (Peak-Average Power Ratio) captured signal.

Allowed range when setting the parameter value

Not applicable, this command only provides a query format.

Returned range when querying the parameter value

The PAPR is reported as a value in dB, with two decimal positions.

Preset parameter value

Not applicable

Programming example

Command form

Not applicable

Query form

READ:LTE:MEAS:PAPR?

21 RX MEASUREMENTS commands

SETup:LTE:MEASure:RCVRBLER:MEASLENgth

Function

This function enables you to configure the length, in number of frames, of the receiver measurements to be performed by the system.

Allowed range when setting the parameter value

This parameter can be configured as a number of frames in the range of 10 to 3600000, in steps of 10.

Returned range when querying the parameter value

Same as previous.

Preset parameter value

The default value for this parameter is 1000 frames.

Programming example

Command form

SET:LTE:MEAS:RCVRBLER:MEASLEN 100

Query form

SET:LTE:MEAS:RCVRBLER:MEASLEN?

READ<carrier:_id#>:LTE:MEASure:RCVRBLER?

Function

This function triggers the system to perform a UE receiver BLER measurement based on the HARQ feedback provided by the UE along a configured number of consecutive frames.

Allowed range when setting the parameter value

Not applicable.

Returned range when querying the parameter value

The measurement reports two different, although related, values:

- HARQ BLER, as a percentage value in the range 0.00% to 100.00%.
- MAC level throughput, as a value given in kbps, with four decimal positions.

The parameters are reported as a string with the parameters appearing in the same order in which they are shown in the list above.

Preset parameter value

Not applicable

Programming example

Command form

Not applicable

Query form

READ1:LTE:MEAS:RCVRBLER?

READ:LTE:MEASure:TOTALRCVRBLER?

Function

This function triggers the system to perform a UE receiver BLER measurement based on the HARQ feedback provided by the UE along a configured number of consecutive frames.

This command returns the aggregated (for example: PCC+SCC) BLER and Throughput measurements, so it is only useful if Carrier Aggregation is enabled.

Allowed range when setting the parameter value

Not applicable

Returned range when querying the parameter value

The measurement reports two different, although related, values:

- The aggregated HARQ BLER, as a percentage value in the range 0.00% to 200.00%.
- The aggregated MAC level throughput, as a value given in kbps, with four decimal positions.

The parameters are reported as a string with the parameters appearing in the same order in which they are listed in the list above.

Preset parameter value

Not applicable

Programming example

Command form

Not applicable.

Query form

READ:LTE:MEASURE:TOTALRCVRBLER?

READ:LTE:MEASure:COMPACT:RCVRBLER?

Function

This function triggers the system to perform a UE receiver BLER measurement based on the HARQ feedback provided by the UE along a configured number of consecutive frames.

This command returns PCC, SCC and the aggregated (for example: PCC+SCC) BLER and Throughput measurements, so it is only useful if Carrier Aggregation is enabled.

Allowed range when setting the parameter value

Not applicable

Returned range when querying the parameter value

The measurement reports two different, although related, values:

- PCC HARQ BLER, as a percentage value in the range 0.00% to 100.00%.
- PCC MAC level throughput, as a value given in kbps, with four decimal positions.
- SCC HARQ BLER, as a percentage value in the range 0.00% to 100.00%.
- SCC MAC level throughput, as a value given in kbps, with four decimal positions.
- The aggregated HARQ BLER, as a percentage value in the range 0.00% to 100.00%.
- The aggregated MAC level throughput, as a value given in kbps, with four decimal positions.

The parameters are reported as a string with the parameters appearing in the same order in which they are listed in the list above.

Preset parameter value

Not applicable

Programming example

Command form

Not applicable.

Query form

READ:LTE:MEAS:COMPACT:RCVRBLER?

READ:LTE:MEASure:TXBLER?

Function

This function triggers the system to perform a UE transmitter BLER measurement based on the HARQ feedback provided to the UE along a configured number of consecutive frames.

Allowed range when setting the parameter value

Not applicable.

Returned range when querying the parameter value

The measurement reports two different, although related, values:

- HARQ BLER, as a percentage value in the range 0.00% to 100.00%.
- MAC level throughput, as a value given in kbps, with four decimal positions.

The parameters are reported as a string with the parameters appearing in the same order in which they are listed in the list above.

Preset parameter value

Not applicable

Programming example

Command form

Not applicable

Query form

READ:LTE:MEAS:TXBLER?

SETup:LTE:MEASure:CQIREPorting:MEASLENgth

Function

This function enables you to configure the length, in number of frames, of the CQI measurements to be performed by the system.

Allowed range when setting the parameter value

This parameter can be configured as a number of frames in the range of 50 to 360000, in steps of 10.

Returned range when querying the parameter value

Same as previous.

Preset parameter value

The default value for this parameter is 50 frames.

Programming example

Command form

SET:LTE:MEAS:CQIREP:MEASLEN 100

Query form

SET:LTE:MEAS:RCVRBLER:MEASLEN?

READ<carrier_id#>:LTE:MEASure:CQIREPorting?

Function

This function triggers the system to perform a UE CQI report measurement based on the CQI reports provided by the UE from the moment the command is issued.

This command returns values after the amount of CQI reports configured through the command SETup:LTE:MEASure:CQIREPorting:MEASLENgth have been received by the LTE/LTE-A Network Emulator.

You need to have previously activating the CQI reporting functionality in the TA/LA.

Allowed range when setting the parameter value

Not applicable.

Returned range when querying the parameter value

The measurement reports several parameters:

- Minimum CQI reported value during the measurement period.
- Maximum CQI reported value during the measurement period.
- Average CQI reported value during the measurement period, rounded to closest smaller value.
- Median CQI reported value during the measurement period, rounded to closest smaller value.

The parameters are reported as a string with the parameters appearing in the same order in which they are shown in the list above.

Preset parameter value

Not applicable

Programming example

Command form

Not applicable

Query form

READ1:LTE:MEAS:CQIREP?

READ:LTE:MEASure:RSRPRSRQREPorting?

Function

This function triggers the system to return the latest UE RSRP/RSRQ report provided by the UE at the moment the command is issued.

You need to have previously activating RSRP/RSRQ reporting functionality in the TA/LA.

Allowed range when setting the parameter value

Not applicable.

Returned range when querying the parameter value

The measurement reports several parameters:

- Latest RSRP report value provided by the UE.
- Latest RSRQ report value provided by the UE.

The parameters are reported as a string with the parameters appearing in the same order in which they are shown in the list above.

Preset parameter value

Not applicable

Programming example

Command form

Not applicable

Query form

READ:LTE:MEAS:RSRPRSRQREP?

READ:LTE:MEASure: DL:IPTHroughput?

Function

This function triggers the system to return the latest UE IP Throughput DL report provided by the UE at the moment the command is issued.

Allowed range when setting the parameter value

Not applicable.

Returned range when querying the parameter value

The measurement reports the following parameter:

- Average, peak and transferred bytes values provided by the UE in DL.

The parameters are reported as a string with the parameters appearing in the same order in which they are listed in the list above.

Preset parameter value

Not applicable

Programming example

Command form

Not applicable

Query form

READ:LTE:MEAS:DL:IPTH?

READ:LTE:MEASure: UL:IPTHroughput?

Function

This function triggers the system to return the latest UE IP Throughput UL report provided by the UE at the moment the command is issued.

Allowed range when setting the parameter value

Not applicable.

Returned range when querying the parameter value

The measurement reports the following parameter:

- Average, peak and transferred bytes values provided by the UE in UL.

The parameters are reported as a string with the parameters appearing in the same order in which they are shown in the list above.

Preset parameter value

Not applicable

Programming example

Command form

Not applicable

Query form

READ:LTE:MEAS:UL:IPTH?

READ:LTE:MEASure: COMPact:IPTHroughput?

Function

This function triggers the system to return the latest brief report about UE IP Throughput in the UE at the moment the command is issued.

Allowed range when setting the parameter value

Not applicable.

Returned range when querying the parameter value

The measurement reports the following parameter:

- IP DL average throughput (bps)
- IP DL transferred bytes
- IP UL average throughput (bps)
- IP UL transferred bytes
- PDSCH PCC average throughput (bps)
- PDSCH PCC maximum throughput (bps)
- PDSCH PCC transferred bytes
- PDSCH SCC average throughput (bps)
- PDSCH SCC maximum throughput (bps)
- PDSCH SCC transferred bytes
- OTA DL average throughput (bps)
- OTA DL maximum throughput (bps)
- OTA DL transferred bytes
- OTA UL average throughput (bps)
- OTA UL maximum throughput (bps)
- OTA UL transferred bytes.

The parameters are reported as a string with the parameters appearing in the same order in which they are shown in the list above.

Preset parameter value

Not applicable

Programming example

Command form

Not applicable

Query form

READ:LTE:MEAS:COMP:IPTH?

READ<carrier_id#>:LTE:MEASure:HISTogram:CQI?

Function

This function triggers the system to return the CQI report provided by the UE at the moment the command is issued.

Allowed range when setting the parameter value

Not applicable.

Returned range when querying the parameter value

The measurement reports the following parameter:

- The number of CQI reports received for each one of the CQI values (CQI0, CQI1, CQI2, …,CQI15) related to Codeword 1.
- The number of CQI reports received for each one of the CQI values (CQI0, CQI1, CQI2, …,CQI15) related to Codeword 2.

The parameters are reported as a string with the parameters appearing in the same order in which they are shown in the list above.

Preset parameter value

Not applicable

Programming example

Command form

Not applicable

Query form

READ:LTE:MEAS:HIST:CQI?

READ<carrier_id#>:LTE:MEASure:HISTogram:RI?

Function

This function triggers the system to return the RI values provided by the UE at the moment the command is issued.

Allowed range when setting the parameter value

Not applicable.

Returned range when querying the parameter value

The measurement reports the following parameter:

- The number of RI reports received with values RI1.
- The number of RI reports received with values RI2.

The parameters are reported as a string with the parameters appearing in the same order in which they are shown in the list above.

Preset parameter value

Not applicable

Programming example

Command form

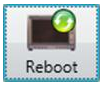
Not applicable

Query form

READ:LTE:MEAS:HIST:RI?

22 Troubleshooting

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

1. If you are not able to communication with the instrument via remote commands, review the section above entitled, *Communication with the Instrument* on page 13. Verify that:
    - your remote programming PC is connected to port 55000
    - you are able to successfully '**ping**' the IP address you specified for the UXM
2. Select the *Reboot* icon 

in the Control Panel whenever the UXM hardware and/or software appears to be in a faulty state. Once the Control Panel indicator turns green, the UXM is in the ready state and you can proceed with your testing. Note that you may need to perform this reboot more than once to obtain the green display indicator condition.
3. Perform the BIST if rebooting the Platform boards does not cause the Control Panel indicator to display the green state. These tests provide you with valuable information when speaking with your Agilent representative. Refer to the section entitled, *Built-in Self Tests (BIST)* in the UXM Getting Started Guide for detailed instructions.

Returning Your Test Set for Service

Calling Agilent Technologies

Agilent Technologies has offices around the world to provide you with complete support for your wireless test set. To obtain servicing information or to order replacement parts, contact the nearest Agilent Technologies office listed below or go to www.agilent.com/find/contactus. In any correspondence or telephone conversations, refer to your test set by its product number, full serial number, and software revision.

To access your product information, select this icon 

in the Control Panel view after performing both or only the second action described below:

1. If you are inside the TA/LA software application, press the windows icon  key on your USB connected keyboard to enable you to view your windows task bar .
2. Once you have access to the windows task bar, double-click the Control Panel icon:  to maximize the Control Panel view.

Locations for Agilent Technologies

Online assistance: http://www.agilent.com/find/assist

If you do not have access to the Internet, one of these centers can direct you to your nearest representative:

Should the Declaration of Conformity be required, please contact an Agilent Sales Representative, or the closest Agilent Sales Office. Alternately, contact Agilent at: www.agilent.com.

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