EG800Q-EU&EG915Q-NA
QuecCell Application Note

LTE Standard Module Series

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Quectel Wireless Solutions Co., Ltd.
Building 5, Shanghai Business Park Phase III (Area B), No.1016 Tianlin Road, Minhang District, Shanghai 200233, China
Tel: +86 21 5108 6236
Email: info@quectel.com

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About the Document

Revision History

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-	2023-04-13	Alwyn YE	Creation of the document
1.0	2023-05-06	Alwyn YE	First official release

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1 Introduction

This document introduces AT commands related to QuecCell on Quectel EG800Q-EU and EG915Q-NA modules.

QuecCell is a featured function embedded in the module. It can be used to scan the detailed information of base stations.

2 Description of AT Commands

2.1. AT Command Introduction

2.1.1. Definitions

- **<CR>** Carriage return character.
- **<LF>** Line feed character.
- **<...>** Parameter name. Angle brackets do not appear on command line.
- **[...]** Optional parameter of a command or an optional part of TA information response. Square brackets do not appear on the command line. When an optional parameter is not given in a command, the new value equals its previous value or the default settings, unless otherwise specified.
- **Underline** Default setting of a parameter.

2.1.2. AT Command Syntax

All command lines must start with **AT** or **at** and end with **<CR>**. Information responses and result codes always start and end with a carriage return character and a line feed character: **<CR><LF><response><CR><LF>**. In tables presenting commands and responses throughout this document, only the commands and responses are presented, and **<CR>** and **<LF>** are deliberately omitted.

Table 1: Types of AT Commands

Command Type	Syntax	Description
Test Command	**AT+<cmd>=?**	Test the existence of the corresponding command and return information about the type, value, or range of its parameter.
Read Command	**AT+<cmd>?**	Check the current parameter value of the corresponding command.
Write Command	**AT+<cmd>=<p1>[,<p2>[,<p3>[...]]]**	Set user-definable parameter value.
Execution Command	**AT+<cmd>**	Return a specific information parameter or perform a specific action.

2.2. Declaration of AT Command Examples

The AT command examples in this document are provided to help you familiarize with AT commands and learn how to use them. The examples, however, should not be taken as Quectel's recommendation or suggestions about how you should design a program flow or what status you should set the module into. Sometimes multiple examples may be provided for one AT command. However, this does not mean that there exists a correlation among these examples and that they should be executed in a given sequence.

2.3. AT+QENG Get Information of Primary Serving Cell and Neighbour Cells

This command gets the information of the primary serving cell and neighbour cells.

AT+QENG Get Information of Primary Serving Cell and Neighbour Cells	
Test Command **AT+QENG=?**	Response **+QENG: (**list of supported **<cell_type>**s**)** **OK**
Write Command **AT+QENG="servingcell"**	Response **+QENG: "servingcell",<state>,"LTE",<is_tdd>,<MCC>,<MNC>,<cellID>,<PCI>,<EARFCN>,<freq_band_ind>,<UL_bandwidth>,<DL_bandwidth>,<TAC>,<RSRP>,<RSRQ>,<RSSI>,<SINR>,<srxlev>** **OK**
Write Command **AT+QENG="neighbourcell"**	Response **[+QENG: "neighbourcell intra","LTE",<EARFCN>,<PCI>,<RSRQ>,<RSRP>,-,-,-,-,-,-** **[…]]** **[+QENG: "neighbourcell inter","LTE",<EARFCN>,<PCI>,<RSRQ>,<RSRP>,-,-,-,-,-,-** **[…]]** **OK**
Maximum Response Time	300 ms
Characteristics	/

Parameter

<cell_type>	String type. Information of different cells. "servingcell" Information of 4G serving cells "neighbourcell" Information of 4G neighbour cells
<state>	String type. UE state. "SEARCH" UE is searching but could not (yet) find a suitable 4G cell "LIMSRV" UE is camping on a cell but has not registered on the network "NOCONN" UE has camped on a cell and registered on the network, and it is in idle state "CONNECT" UE has camped on a cell and registered on the network, and a call is in progress
<is_tdd>	String type. Communication mode. "TDD" Time division duplex mode "FDD" Frequency division duplex mode
<MCC>	Integer type. Mobile country code (first part of the PLMN code).
<MNC>	Integer type. Mobile network code (second part of the PLMN code).
<cellID>	Hexadecimal format. Cell ID. Range: 0–0xFFFFFFF.
<PCI>	Integer type. Physical cell identity. Range: 0–503.
<EARFCN>	Integer type. E-UTRA absolute radio frequency channel number.
<freq_band_ind>	Integer type. E-UTRA frequency band. (See *3GPP 36.101*).
<UL_bandwidth>	Integer type. Uplink bandwidth. 0 1.4 MHz 1 3 MHz 2 5 MHz 3 10 MHz 4 15 MHz 5 20 MHz
<DL_bandwidth>	Integer type. Downlink bandwidth. 0 1.4 MHz 1 3 MHz 2 5 MHz 3 10 MHz 4 15 MHz 5 20 MHz
<TAC>	Hexadecimal format. Tracking area code. Range: 0–0xFFFFFFFF. (See *3GPP 23.003 subclause 19.4.2.3*).
<RSRP>	Integer type. Reference signal received power. Range: -156 to -44. Unit: dBm. (See *3GPP 36.214 subclause 5.1.1*).
<RSRQ>	Integer type. Reference signal received quality. Range: -34 to 2.5. Unit:dB. (See *3GPP 36.214 subclause 5.1.3*).
<RSSI>	Integer type. Received signal strength indication. Range: -120 to -25. Unit: dBm.

<SINR>	Integer type. Signal to interference plus noise ratio. Range: -20 to 40. Unit: dB.
<srxlev>	Integer type. Cell selection Rx level value. Unit: dB. (See *3GPP 25.304/3GPP 36.304*).

NOTE

1. After executing **AT+QENG="neighbourcell"**, if intra-frequency neighbour cell is found, **+QENG: "neighbourcell intra","LTE",<EARFCN>,<PCI>,<RSRQ>,<RSRP>,-,-,-,-,-,-** is returned; if inter-frequency neighbour cell is found, **+QENG: "neighbourcell inter","LTE",<EARFCN>,<PCI>,<RSRQ>,<RSRP>,-,-,-,-,-,-** is returned. If intra-frequency neighbour cell is found, the information of intra-frequency neighbour cell is returned first; if intra-frequency neighbour cell is not found, only the information of inter-frequency neighbour cell is returned.
2. It indicates that the parameter is invalid under current conditions when "-" or - is returned.

Example

```
AT+QENG="servingcell"
+QENG: "servingcell","SEARCH"

OK
AT+QENG="servingcell"
+QENG:"servingcell","NOCONN","LTE","FDD",460,11,B57DE09,352,100,1,5,5,B504,-85,-8,-70,13,
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OK
AT+QENG="neighbourcell"
+QENG: "neighbourcell intra","LTE",100,353,-20,-106,-,-,-,-,-,-
+QENG: "neighbourcell intra","LTE",100,210,-20,-106,-,-,-,-,-,-
+QENG: "neighbourcell inter","LTE",1850,63,-19,-88,-,-,-,-,-,-
+QENG: "neighbourcell inter","LTE",1850,362,-20,-96,-,-,-,-,-,-

OK
```

2.4. AT+QCELL Get Information of Serving Cell and Neighbour Cells

This command gets the information of the serving cell and neighbour cells.

AT+QCELL Get Information of Serving Cell and Neighbour Cells	
Test Command **AT+QCELL=?**	Response **OK**
Read Command **AT+QCELL?**	Response **+QCELL: "servingcell","LTE",<MCC>,<MNC>,<TAC>,<cellID>,<PCI>,<RX_lev>** **[+QCELL: "neighbourcell intra","LTE",<MCC>,<MNC>,<TAC>,<cellID>,<PCI>,<RX_lev>** **[…]]** **[+QCELL: "neighbourcell inter","LTE",<MCC>,<MNC>,<TAC>,<cellID>,<PCI>,<RX_lev>** **[…]]** **OK**
Maximum Response Time	4 s
Characteristics	/

Parameter

<MCC>	Integer type. Mobile country code (the first part of the PLMN code).
<MNC>	Integer type. Mobile network code (the second part of the PLMN code).
<TAC>	Hexadecimal format. Tracking area code. Range: 0–0xffffffff. (See *3GPP 23.003 Section 19.4.2.3*).
<cellID>	Hexadecimal format. Cell ID. Range: 0–0xfffffff.
<PCI>	Integer type. Physical cell identity. Range: 0–503.
<RX_lev>	Integer type. Rx level in the cell. Range: 0–63. Unit: dB. (See *3GPP 25.304*).

NOTE

1. This command can only be executed when the (U)SIM card is not inserted or when the module is in the idle state with the (U)SIM card inserted; it is recommended to use the command when the (U)SIM card is not inserted.
2. After executing **AT+QCELL?**, if intra-frequency neighbour cell is found, **+QCELL: "neighbourcell intra","LTE",<MCC>,<MNC>,<TAC>,<cellID>,<PCI>,<RX_lev>** is returned; if inter-frequency neighbour cell is found, **+QCELL: "neighbourcell inter","LTE",<MCC>,<MNC>,<TAC>,<cellID>,<PCI>,<RX_lev>** is returned. If intra-frequency neighbour cell is found, the information of intra-frequency neighbour cell is returned first; if intra-frequency neighbour cell is not found, only the information of inter-frequency neighbour cell is returned.

Example

```
AT+QCELL?                  // Get the information of serving cell and neighbour cells.
+QCELL: "servingcell","LTE",460,00,550b,d6b5c0,123,36
+QCELL: "neighbourcell inter","LTE",460,00,550b,5e05e2a,20,12
+QCELL: "neighbourcell inter","LTE",460,00,550b,5c4ef29,121,25

OK
```

3 Appendix References

Table 2: Terms and Abbreviations

Abbreviation	Description
3GPP	The 3rd Generation Partnership Project
DL	Downlink
EARFCN	E-UTRA Absolute Radio Frequency Channel Number
E-UTRA	Evolved-Universal Terrestrial Radio Access
FDD	Frequency Division Duplex
LTE	Long Term Evolution
MCC	Mobile Country Code
MNC	Mobile Network Code
PCI	Physical Cell Identity
PLMN	Public Land Mobile Network
RSRP	Reference Signal Received Power
RSRQ	Reference Signal Received Quality
RSSI	Received Signal Strength Indicator
SINR	Signal to Interference Plus Noise Ratio
TA	Terminal Adapter
TAC	Tracking Area Code
TDD	Time Division Duplex
UE	User Equipment
UL	Uplink
UTRA	UMTS Terrestrial Radio Access