EC200U&EG915U Series
Audio Application Note

LTE Standard Module Series

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About the Document

Revision History

Version	Date	Author	Description
-	2021-04-08	Kevin WANG	Creation of the document
1.0	2021-05-08	Kevin WANG	First official release
1.1	2021-09-01	Kevin WANG	1. Added applicable module: EG915U series. 2. Updated related description of audio channels (Chapter 1.1). 3. Updated related description of parameters for setting audio mode (Chapter 2.3.6). 4. Added AT+QWTTS (Chapter 2.3.9). 5. Added AT+QICMIC (Chapter 2.3.13). 6. Added AT+QICSIDET (Chapter 2.3.14). 7. Updated description of error codes (Chapter 3).

Contents

Table Index

1 Introduction

This document introduces audio related AT commands on Quectel LTE standard EC200U series and EG915U series modules.

NOTE

Only EC200U-CN and EG915U-CN modules support TTS function.

1.1. Audio Channels

The audio channels can be switched by **AT+QAUDMOD**. See ***Chapter 2.3.6*** for details.

Table 1: Module Supported Audio Channels

Module Series	Supported Audio Channels
EC200U Series	speaker
EG915U Series	handset, headset

2 Description of Audio AT Commands

2.1. AT Commands 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 to 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 2: Type of AT Commands and Responses

Command Type	Syntax	Description
Test Command	**AT+<cmd>=?**	Test the existence of corresponding Write Command and give information about the type, value, or range of its parameter.
Read Command	**AT+<cmd>?**	Check the current parameter value of a corresponding Write 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 learn about how to use the AT commands introduced herein. 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 Command Description

2.3.1. AT+CLVL Loudspeaker Volume Level Selection

This command selects the volume level of the internal loudspeaker of MT.

AT+CLVL Loudspeaker Volume Level Selection	
Test Command **AT+CLVL=?**	Response **+CLVL: (**range of supported **<level>**s**)** **OK**
Read Command **AT+CLVL?**	Response **+CLVL: <level>** **OK** Or **ERROR**
Write Command **AT+CLVL=<level>**	Response **OK** Or **ERROR** If there is any error related to ME functionality: **+CME ERROR: <err>**
Maximum Response Time	300 ms
Characteristics	The command takes effect immediately. The configuration will be saved automatically.
Reference 3GPP TS 27.007	

Parameter

<level>	Integer type. Loudspeaker volume level with manufacturer specific range (Smallest value represents the lowest sound level). Range: 0–5. Default value: 3.
<err>	Error codes. For more details, see ***Chapter 3***.

2.3.2. AT+QAUDLOOP Control Audio Loop Test

This command enables/disables audio loop test.

AT+QAUDLOOP Control Audio Loop Test	
Test Command **AT+QAUDLOOP=?**	Response **+QAUDLOOP: (**list of supported **<enable>**s**)** **OK**
Read Command **AT+QAUDLOOP?**	Response **+QAUDLOOP: <enable>** **OK**
Write Command **AT+QAUDLOOP=<enable>**	Response **OK** Or **ERROR**
Maximum Response Time	300 ms
Characteristics	The command takes effect immediately. The configuration will not be saved.

Parameter

<enable>	Integer type. Enable/disable audio loop test. 0 Disable 1 Enable

2.3.3. AT+QAUDRD Record Audio File

This command records the uplink or downlink speech during a voice call or records sound from local microphone in idle state and saves it to files.

AT+QAUDRD Record Audio File	
Test Command **AT+QAUDRD=?**	Response **+QAUDRD: (**list of supported of **<state>**s**),<file_name>,(**list of supported **<format>),(**list of supported **<dlink>**s**)**

	OK
Read Command **AT+QAUDRD?**	Response **+QAUDRD: <state>** **OK**
Write Command **AT+QAUDRD=<control>[,<file_name>[,<format>[,<dlink>]]]**	Response **OK** Or **ERROR** If there is any error related to ME functionality: **+CME ERROR: <err>**
Maximum Response Time	300 ms
Characteristics	/

Parameter

<state>	Integer type. Module state. 0 Module is not recording sound 1 Module is recording sound
<control>	Integer type. 0 Stop recording 1 Start recording
<file_name>	String type. Name of the recorded audio file. The default storage path is *UFS:*.
<format>	Integer type. Format of the file. It is specified by the file suffix and supports WAV, AMR, AWB and PCM formats. The fixed value is 13 (This parameter configuration is not supported currently).
<dlink>	Integer type. Record the uplink or downlink sound. 0 Record uplink sound 1 Record downlink sound
<err>	Error codes. For more details, see ***Chapter 3***.

NOTE

1. If the name and format of the recording file are the same with that of an existing file or an unknown error occurs, URC **+QAUDRIND: 0,1** will be reported.
2. If current recording is interrupted by other audio tasks, URC **+QAUDRIND: 0,6** will be reported.
3. If there is no space available for recording, URC **+QAUDRIND: 0,3** will be reported.
4. The module supports both text and audio playing, but asynchronously.
5. Recording downlink sound is prohibited in non-calling mode; recording uplink sound is prohibited in calling mode.

6. The module supports WAV, AMR, AWB and PCM recording formats.

Table 3: The Description of <code> in URC +QAUDRIND: 0,<code>

<code>	Meaning
0	Saved
1	Unknown error
3	No space for recording
6	Interrupted by other audio tasks

Example

```
AT+QAUDRD=1,"A.wav",13,0        //Record the uplink sound in WAV format and store it in UFS:.
OK
AT+QAUDRD=0                     //Stop recording.
OK
AT+QAUDRD=1,"B.wav",13,1        //Record the downlink sound in WAV format during the call and store
                                it in UFS:.

OK
AT+QAUDRD=0                     //Stop recording.
OK
```

2.3.4. AT+QPSND Play Audio File to Far-End or Near-End

This command plays local audio file to far-end or near-end.

AT+QPSND Play Audio File to Far-End or Near-End	
Test Command **AT+QPSND=?**	Response **+QPSND: (**list of supported **<control>**s**),<file_name>,(**list of supported **<repeat>**s**),(**list of supported **<ulmute>**s**),(**list of supported **<dlmute>**s**)** **OK**
Read Command **AT+QPSND?**	Response **+QPSND: <state>** **OK**

Write Command **AT+QPSND=<control>,<file_name>,<repeat>[,<ulmute>[,<dlmute>]]**	Response **OK** Or **ERROR** If there is any error related to ME functionality: **+CME ERROR: <err>** When the playback is completed: **+QPSND: 0**
Maximum Response Time	300 ms
Characteristics	/

Parameter

<state>	Integer type. Module state. 0 Module is not playing the file 1 Module is playing the file
<control>	Integer type. 0 Stop playing 1 Start playing
<file_name>	String type. Name of local audio file, including file path, file name and file suffix. The default path is *UFS:*.
<repeat>	Integer type. Play the file once or repeatedly. 0 Play only once 1 Play repeatedly
<ulmute>	Integer type. Mute or not mute uplink. 0 Mute 1 Not mute
<dlmute>	Integer type. Mute or not mute downlink. 0 Mute 1 Not mute
<err>	Error codes. For more details, see ***Chapter 3***.

NOTE

1. The module only supports 8K linear and single-wave mono playing formats when playing the uplink audio.
2. Playing downlink sound is prohibited in calling mode; Playing uplink sound is prohibited in non-calling mode.
3. **<ulmute>** and **<dlmute>** cannot be set to 0 or 1 simultaneously.

Example

```
AT+QPSND=1,"A.wav",0,0,1          //Play a .wav file which is stored in UFS once.
OK

+QPSND: 0
AT+QPSND=1,"A.wav",0,1,0          //Play a .wav file to far-end once when a call is ongoing.
OK

+QPSND: 0
```

2.3.5. AT+QAUDPLAY Play Local Audio File

This command plays local audio file to near-end.

AT+QAUDPLAY Play Local Audio File	
Test Command **AT+QAUDPLAY=?**	Response **+QAUDPLAY: <file_name>,(**list of supported **<state>**s**)** **OK**
Read Command **AT+QAUDPLAY?**	Response **+QAUDPLAY: <state>** **OK**
Write Command **AT+QAUDPLAY=<file_name>,<repeat>**	Response **OK** Or **ERROR** If there is any error related to ME functionality: **+CME ERROR: <err>** When the playback is completed: **+QAUDPLAY: 0**
Maximum Response Time	300 ms
Characteristics	The command takes effects immediately. The configurations will not be saved.

Parameter

<state>	Integer type. Module state. 0 Module is not playing audio 1 Module is playing audio

<file_name>	String type. Name of local media file, includes file path, file name and file suffix. File path must be *UFS:*.
<repeat>	Integer type. Play the file once or repeatedly. 0 Play only once 1 Play repeatedly
<err>	Error codes. For more details, see ***Chapter 3***.

NOTE

1. If there is an unknown error occurred, the module reports URC **+QAUDPIND: 0,1**.
2. If current playing is interrupted by other audio tasks, the module reports URC **+QAUDPIND: 0,6**.

2.3.6. AT+QAUDMOD Set Audio Mode

This command sets the audio mode required for the connected device.

AT+QAUDMOD Set Audio Mode	
Test Command **AT+QAUDMOD=?**	Response **+QAUDMOD: (**range of supported **<mode>**s**)** **OK**
Read command **AT+QAUDMOD?**	Response **+QAUDMOD: <mode>** **OK**
Write Command **AT+QAUDMOD=<mode>**	Response **OK** Or **ERROR** If there is any error related to ME functionality: **+CME ERROR: <err>**
Maximum Response Time	300 ms
Characteristics	The command takes effect on next sound action. The configuration will not be saved.

Parameter

<mode>	Integer type. The current audio mode. 0 Echo canceller, noise suppressor, digital gain and calibration parameter for handset 1 Echo canceller, noise suppressor, digital gain and calibration parameter for headset 2 Echo canceller, noise suppressor, digital gain and calibration parameter for speaker

<err>	Error codes. For more details, see ***Chapter 3***.

NOTE

Parameter echo canceller, noise suppressor, digital gain and calibration are different in different audio modes.

2.3.7. AT+QIIC Read/Write Codec via IIC

This command reads/writes codec via IIC interface.

AT+QIIC Read/Write Codec via IIC	
Test Command **AT+QIIC=?**	Response **+QIIC: (**list of supported **<rw>**s**),(**list of supported **<device>**s**),(**list of supported **<addr>**s**),(**list of supported **<bytes>**s**),(**list of supported **<value>**s**)** **OK**
Write Command **AT+QIIC=<rw>,<device>,<addr>,<bytes>[,<value>]**	Response If **<rw>**=0, all configuration parameters should be specified: **OK** If **<rw>**=1, **<value>** should be omitted: **+QIIC: <value>** **OK**
Maximum Response Time	300 ms
Characteristics	The command takes effect immediately. The configurations will not be saved.

Parameter

<rw>	Integer type. Write or read the command. 0 Write 1 Read
<device>	Hex integer type. 7-bit slave device address. Range: 0–0xFF. Currently only support ALC5616 device address 0x1B and NAU88C10 device address 0x1A.
<addr>	Hex integer type. Register address. Range: 0–0xFFFF.
<bytes>	Integer type. 1 Read bytes 2 Write bytes

<value>	Hex integer type. Data value. Range: 0–0xFFFF.

Example

```
AT+QIIC=1,0x1B,0x27,1          //Read 1-byte register content of the register's location: slave. address: 0x1B, register address: 0x27.

+QIIC: 0x21

OK
AT+QIIC=0,0x1B,0x27,1,0x21     //Write 1-byte register content of the register's location: slave. address: 0x1B, register address:0x27, date value: 0x21.

OK
```

2.3.8. AT+QTTS Play Text

This command plays text.

AT+QTTS Play Text	
Test Command **AT+QTTS=?**	Response **+QTTS: (**range of supported **<mode>**s**),<text>** **OK**
Read Command **AT+QTTS?**	Response **+QTTS: <status>** **OK**
Write Command **AT+QTTS=<mode>[,<text>]**	Response **OK** Or **ERROR** If there is any error related to ME functionality: **+CME ERROR: <err>** When the text playback is completed: **+QTTS: 0**
Maximum Response Time	300 ms
Characteristics	The command takes effect immediately. The configurations will not be saved.

Parameter

<mode>	Integer type. Start/stop playing and also indicate **<text>** format. Range: 0–2. 0 Stop playing, and **<text>** can be omitted. 1 Start playing, and **<text>** uses UCS2 encoding. 2 Start playing, and **<text>** is string type, usually ASCII characters, and is GBK encoding in Chinese.
<text>	String type. Text to be played. The text format depends on **<mode>**. Maximum length: 548 bytes.
<status>	Integer type. Status of the TTS player. 0 Idle 1 Busy
<err>	Error codes. For more details, see ***Chapter 3***.

NOTE

1. The module supports playing text with this command during a non-call process.
2. Text playing will be terminated during a call.
3. The module supports both text and audio playing, but asynchronously.

Example

```
AT+QTTS=?                                          //Test command.
+QTTS: (0-2),<text>

OK
AT+QTTS=1,"6B228FCE4F7F752879FB8FDC6A215757"       //Play an UCS2 string.
OK

+QTTS: 0
AT+QTTS=2,"hello world,你好"                        //Play an ASCII string.
OK

+QTTS: 0
AT+QTTS=0                                          //Stop playing.
OK
```

2.3.9. AT+QWTTS Play/Send Text to Far-end

This command plays text or sends text to far-end during a call.

AT+QWTTS Play/Send Text to Far-end	
Test Command **AT+QWTTS=?**	Response **+QWTTS: (**list of supported **<ulmute>**s**),(**list of supported **<dlmute>**s**),(**range of supported **<mode>**s**),<text>** **OK**
Read Command **AT+QWTTS?**	Response **+QWTTS: <status>** **OK**
Write Command **AT+QWTTS=<ulmute>,<dlmute>,<mode>[,<text>]**	Response **OK** Or **ERROR** If there is any error related to ME functionality: **+CME ERROR: <err>** When the text play is completed: **+QWTTS: 0**
Maximum Response Time	300 ms
Characteristics	The command takes effect immediately. The configurations will not be saved.

Parameter

<ulmute>	Integer type. Not mute the uplink. 1 Not mute
<dlmute>	Integer type. Mute the downlink. 0 Mute
<mode>	Integer type. Start/stop playing and specify **<text>** format. 0 Stop playing. **<text>** can be ignored. 1 Start playing. **<text>** uses UCS2 encoding. 2 Start playing. **<text>** is string type, usually ASCII characters, and is GBK encoding in Chinese.
<text>	String type. Text to be played. The text format depends on **<mode>**. Maximum length: 548 bytes.
<status>	Integer type. Status of the TTS player.

	0	Idle
	1	Busy
<err>	Error codes. For more details, see ***Chapter 3***.	

NOTE

+QWTTS: 4111 means that TTS playing is interrupted by a call.

Example

```
AT+QWTTS=?                                          //Test command
+QWTTS: (1),(0),(0-2),<text>

OK
AT+QWTTS=1,0,1,"6B228FCE4F7F752879FB8FDC6A215757"   //Play an UCS2 string and send it to
                                                      far-end during a call
OK

+QWTTS: 0
AT+QWTTS=1,0,2,"hello world,你好"                    //Play an ASCII string and send it to
                                                      far-end during a call
OK

+QWTTS: 0                                           //The text play is completed
AT+QWTTS=1,0,0                                      //Stop playing
OK
```

2.3.10. AT+QTTSETUP Set Parameters for TTS

This command sets the TTS speed or adjusts the volume.

AT+QTTSETUP Set Parameters for TTS	
Test Command **AT+QTTSETUP=?**	Response **+QTTSETUP: (**list of supported **<mode>**s**),(**list of supported **<ID>**s**),(**range of supported **<value>**s**)** **OK**
Read Command **AT+QTTSETUP?**	Response **OK**
Write Command **AT+QTTSETUP=<mode>,<ID>[,<value>]**	Response If **<mode>**=1, all parameters are specified: **OK**

	Or **ERROR** If **<mode>**=2, optional parameter should be omitted: **+QTTSETUP: 2,<ID>,<value>** If there is any error related to ME functionality: **+CME ERROR: <err>**
Maximum Response Time	300 ms
Characteristics	The command takes effect immediately. The configurations will not be saved.

Parameter

<mode>	Integer type. Write or read the parameter value. 1 Write 2 Read
<ID>	Integer type. 1 Speed 2 Volume
<value>	Integer type. Speed or volume value. If **<mode>**=2, **<value>** is omitted in the Write Command, and it means to read the current speed or volume value. Speed Range: -32768 to 32767. Normal speed: 0. Default value: 0. Volume Range: -32768 to 32767. Default value: 0.
<err>	Error codes. For more details, see ***Chapter 3***.

Example

```
AT+QTTSETUP=?                          //Test command.
+QTTSETUP: (1,2),(1,2),(-32768-32767)

OK
AT+QTTSETUP=1,2,0                      //Set the volume to 0.
OK
```

2.3.11. AT+QAUDPASW Select Audio PA Type

This command selects audio PA type.

AT+QAUDPASW Select Audio PA Type	
Test Command **AT+QAUDPASW=?**	Response **+QAUDSW: (**list of supported **<n>**s**)** **OK**
Read Command **AT+QAUDPASW?**	Response **+QAUDPASW: <n>** **OK**
Write Command **AT+QAUDPASW=<n>**	Response **OK** Or **ERROR** If there is any error related to ME functionality: **+CME ERROR: <err>**
Maximum Response Time	300 ms
Characteristics	The command takes effect immediately. The configuration will be saved automatically.

Parameter

<n>	Integer type. PA type. 0 AB type 1 D type
<err>	Error codes. For more details, see ***Chapter 3***.

2.3.12. AT+QAUDSW Select Codec

This command selects the built-in codec or the external one.

AT+QAUDSW Select Codec	
Test Command **AT+QAUDSW=?**	Response **+QAUDSW: (**list of supported**<n>**s**)** **OK**
Read Command **AT+QAUDSW?**	Response **+QAUDSW: <n>**

	OK
Write Command **AT+QAUDSW=<n>**	Response **OK** Or **ERROR** If there is any error related to ME functionality: **+CME ERROR: <err>**
Maximum Response Time	300 ms
Characteristics	The command takes effect immediately. The configuration will be saved automatically.
Reference 3GPP TS 27.007	

Parameter

<n>	Integer type. 0 External codec 1 Built-in codec
<err>	Error codes. For more details, see ***Chapter 3***.

2.3.13. AT+QICMIC Set Uplink Gains of MIC

This command sets the uplink gains of the microphone.

AT+QICMIC Set Uplink Gains of MIC	
Test Command **AT+QICMIC=?**	Response **+QICMIC: (**range of supported **<txgain>**s**),(**range of supported **<txdgain>**s**)** **OK**
Read Command **AT+QICMIC?**	Response **+QICMIC: <txgain>,<txdgain>** **OK**
Write Command **AT+QICMIC=<txgain>[,<txdgain>]**	Response **OK** Or **ERROR**
Maximum Response Time	300 ms

Characteristics	The command takes effect on next call. The configurations will not be saved.

Parameter

<txgain>	Integer type. Uplink codec analog gain. Range: 0–7. Default value might be different in different audio modes.
<txdgain>	Integer type. Uplink digital gain. Range: 0–15. Default value might be different in different audio modes.

2.3.14. AT+QICSIDET Set Side Tone Gain in Current Mode

This command sets the side tone gain value in the current mode.

AT+QICSIDET Set Side Tone Gain in Current Mode	
Test Command **AT+QICSIDET=?**	Response **+QICSIDET: (**range of supported **<st_gain>**s**)** **OK**
Read Command **AT+QICSIDET?**	Response **QICSIDET: <st_gain>** **OK**
Write Command **AT+QICSIDET=<st_gain>**	Response **OK** Or **ERROR**
Maximum Response Time	300 ms
Characteristics	The command takes effect on next call. The configuration will not be saved.

Parameter

<st_gain>	Integer type. Indicates the configured side tone gain in current mode. Range: 0–15. Default value might be different in different audio modes.

NOTE

This command is valid only after audio loop test is disabled by **AT+QAUDLOOP** (***Chapter 2.3.2***).

3 Error Codes

Table 4: Error Codes of +CME ERROR: <err>

Code of <err>	Meaning
901	Audio unknown error
902	Audio invalid parameters **<ulmute>** and **<dlmute>**, or null characters played
903	Audio operation not supported: playing TTS in non-call status
904	Audio device busy

4 Appendix Reference

Table 5: Terms and Abbreviations

Abbreviation	Description
ASCII	American Standard Code for Information Interchange
GBK	Chinese Internal Code Specification
IIC	Inter-Integrated Circuit
ME	Mobile Equipment
MIC	Microphone
MSC	Mobile Switching Center
MT	Mobile Termination
PA	Power Amplifier
PCM	Pulse Code Modulation
TA	Terminal Adapter
TTS	Text To Speech
UFS	User File System
URC	Unsolicited Result Code