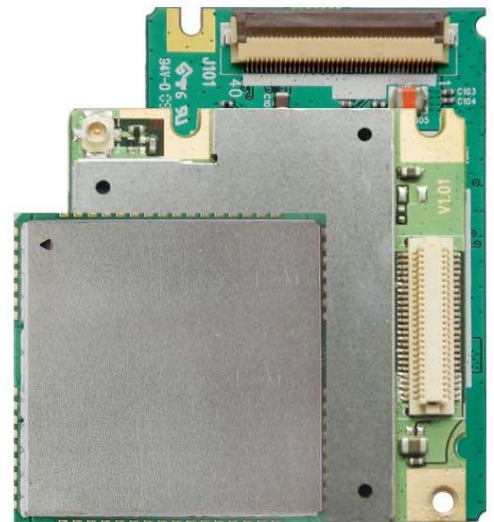




Quectel Cellular Engine

GSM FILE AT Commands

GSM_FILE_ATC_V1.1



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0. Revision history

Revision	Date	Author	Description of change
1.0	2010-04-15	Jay XIN	Initial
1.1	2010-06-10	Jay XIN, Joanna LI	Support SD and RAM

1. Introduction

Quectel Module provides AT commands to operate files in RAM, flash and SD card. This document is a reference guild to these commands.

1.1. Reference

Table 1: Reference

SN	Document name	Remark
[1]	Mxx_ATC	The introduction of AT commands for Mxx

1.2. Terms and abbreviations

Table 2: Terms and abbreviations

Abbreviation	Description
UFS file	File saved in User File Storage directory in Module flash
RAM file	File saved in RAM, only M33 supports
SD file	File saved in Picture directory of SD card, only M33 supports

2. AT Commands for FILE

Quectel Module provides AT commands to operate files in RAM, flash and SD card. Only M33 supports the file operations on RAM and SD card. And The SD card only supports three file systems: FAT, FAT16 and FAT32.

2.1. Overview of AT commands for File

Command	Description
AT+QFLDS	Get storage data size
AT+QFLST	List files
AT+QFUPL	Upload file to storage
AT+QFDWL	Download file from storage
AT+QFDEL	Delete file in storage
AT+QFMOV	Move file

2.2. Detailed descriptions of commands

2.2.1. AT+QFLDS Get storage data size

AT+QFLDS Get storage data size	
Test Command AT+QFLDS=?	Response OK
Write Command AT+QFLDS=<namepattern >	Response +QFLDS: <free size>,<total size>[,<maxalloc size>] OK Parameter <namepattern> pattern "UFS" UFS file in flash "RAM" RAM file (M33 support only) "SD" SD file (M33 support only) <free size> free data size in <namepattern> <total size> total data size in <namepattern> <maxalloc size> the maximum size which can be allocated. only valid for RAM file,
Execution Command AT+QFLDS	Response +QFLDS:<ufs file size>,<ufs file number>

	<p>OK Returns the UFS information</p>
	<p>Parameter <ufs file size> The size in bytes of all files in UFS <ufs file number> The number of files in UFS</p>
Reference	

2.2.2. AT+QFLST List files

AT+QFLST List files	
Test Command AT+QFLST=?	Response OK
Write Command AT+QFLST=<namepattern >	<p>Response +QFLST: <file name>,<file size>[,<ram size>]</p> <p>OK</p> <p>Parameter < namepattern > pattern for filename “*” All UFS file in flash “RAM:*” All RAM file(M33 support only) “SD:*” All SD file (M33 support only) “filename” Name of UFS file “RAM:filename” Name of RAM file “SD:filename” Name of SD file <file name> Name of the file <file size> Size in bytes of the file <ram size> Memory size allocated for the file in RAM, only valid for RAM file</p>
Execution Command AT+QFLST	<p>Response +QFLST: <file name>,<file size></p> <p>OK List files in the UFS directory</p> <p>Parameter <file name> Name of the file <file size> Size in bytes of the file</p>
Reference	<p>Note Only list files in the “Picture” directory of SD card, do not list any directory and any file in the other directories.</p>

2.2.3. AT+QFUPL Upload file to storage

AT+QFUPL Upload file to storage	
Test Command AT+QFUPL=?	<p>Response</p> <p>+QFUPL: "file name",(1-102400),(1-65535)</p> <p>OK</p> <p>Parameter</p> <p>See Write Command.</p>
Write Command AT+QFUPL=<file name>[,<file size>][,<timeout>]	<p>Response</p> <p>CONNECT</p> <p>TA switches to data mode, and the bin data of file can be inputted. When the total size of the input data reaches <file size> (unit: byte) or TA receives “+++” sequence from UART, TA returns to command mode and replies the following codes.</p> <p>+QFUPL: <upload size>,<checksum></p> <p>OK</p> <p>Parameter</p> <p><file name> The name of the file to be stored.</p> <p><file size> The maximum size of the file to upload. Default is 10240. Unit: byte</p> <p><upload size> The size of the actually uploaded data. Unit: byte</p> <p><timeout> The maximum time in seconds to upload data. Default is 65535</p> <p><checksum> The checksum of the uploaded data</p>
Reference	<p>Note:</p> <ul style="list-style-type: none"> ● It is strongly recommended to use DOS 8.3 file name format for <file name>. ● <file name> <ul style="list-style-type: none"> “filename” File is uploaded to the UFS directory “RAM:filename” File is uploaded to RAM (M33 support only) “SD:filename” File is uploaded to Picture directory in SD card (M33 support only) ● <checksum> is 16 bit checksum based on bitwise XOR. ● “+++” sequence will cause TA to end the command and switch to command mode; however, data previously entered are still being preserved as the data of the file. ● To execute the command, must appear "CONNECT" before entering the binary data.

2.2.4. AT+QFDWL Download file from storage

AT+QFDWL Download file from storage	
Test Command AT+QFDWL=?	<p>Response</p> <p>+QFDWL: "file name"</p> <p>OK</p> <p>Parameter</p> <p>See Write Command.</p>
Write Command AT+QFDWL=<file name>	<p>Response</p> <p>CONNECT</p> <p>TA switches to data mode, and the bin data of the file will be outputted. When the file was read over, TA returns to command mode and replies the following codes:</p> <p>+QFDWL: <download size>,<checksum></p> <p>OK</p> <p>Parameter</p> <p><file name> The name of the file to be downloaded</p> <p><download size> The size of the downloaded data</p> <p><checksum> The checksum of the downloaded data</p>
Reference	<p>Note:</p> <ul style="list-style-type: none"> ● <file name> "filename" File is uploaded to the UFS directory "RAM:filename" File is uploaded to RAM (M33 support only) "SD:filename" File is uploaded to Picture directory in SD card (M33 support only) ● "+++" sequence will cause TA to end the command and switch to command mode. ● <checksum> is 16 bit checksum based on bitwise XOR.

2.2.5. AT+QFDEL Delete file in storage

AT+QFDEL Delete file in storage	
Test Command AT+QFDEL=?	<p>Response</p> <p>+QFDEL: "file name"</p> <p>OK</p> <p>Parameter</p> <p>See Write Command.</p>
Write Command AT+QFDEL=<file name>	<p>Response</p> <p>OK</p>

	<p>Parameter</p> <p><file name> The name of the file to be deleted</p> <p>“*” Delete all files in UFS directory (not delete the directory)</p> <p>“RAM:*” Delete all files in RAM (M33 support only)</p> <p>“SD:*” Delete all files in Picture directory of SD card (M33 support only)</p> <p>“filename” delete the specific file “filename” in UFS directory</p> <p>“RAM:filename” delete the specific file “filename” in RAM (M33 support only)</p> <p>“SD:filename” delete the specific file “filename” in Picture directory of SD card (M33 support only)</p>
Reference	<p>Note</p> <p>Only delete file in the Picture directory of SD card, do not delete any directory and any file in the other directories.</p>

2.2.6. AT+QFMOV Move file

AT+QFMOV Move file (M33 support only)	
<p>Test Command</p> <p>AT+QFMOV=?</p>	<p>Response</p> <p>+QFMOV: "src filename", "dest filename", (0,1), (0,1)</p> <p>OK</p>
	<p>Parameter</p> <p>See Write Command.</p>
<p>Write Command</p> <p>AT+QFMOV=<src filename>,<dest filename>,<copy>,<overwrite></p> <p>></p>	<p>Response</p> <p>OK</p> <p>Parameter</p> <p><src filename> source file</p> <p><dest filename> destination file</p> <p><copy> whether deleting source file after the file is copied</p> <p>0 delete source file after file is copied</p> <p>1 not delete source file after file is copied</p> <p><overwrite> whether overwrite existed destination file</p> <p>0 Do not overwrite the destination file if it exists</p> <p>1 Overwrite the destination file if it exists</p>
Reference	<p>Note:</p> <ul style="list-style-type: none"> This command is supported only in M33.

	<ul style="list-style-type: none">● Can not move file from UFS or SD card to RAM.● AT+QFMOV="RAM:*","SD:*",1,1 Move all files in RAM to SD card● AT+QFMOV="RAM:filenamea","SD:filenameb",1,1 Move the file named "filenamea" in RAM to SD card, and rename it as "filenameb".
--	---

3. Summary of error codes

Final result code **+CME ERROR: <err>** indicates an error related to mobile equipment or network. The operation is similar to **ERROR** result code. Neither **ERROR** nor **OK** result code shall be returned. The listed **<err>** codes here are just related with File. About other **<err>** codes, please refer to document [1].

Code of <err>	Meaning
3915	Non-existent address
3916	UFS storage full
3917	Drive full
3918	Drive error
3919	File not found
3920	Invalid file name
3921	File already existed
3922	Failed to create file
3923	Failed to write file
3924	Failed to open file
3925	Failed to read file

4. Reliable transmission

For reliable transmission when using "AT+QFUPL" and "AT+QFDWL" to upload and download file, it's recommended that users turn on hardware flow control capabilities, while also opening MCU hardware flow control function. Using the **AT+IFC=2,2<CRLF>** command to open the hardware flow control function for the module. It is turned on by default.

As general serial transmission is reliable, in order to further reliability, we provide additional ways to verify the data transmission reliability by the command's response information.

When using "AT+QFUPL=<file name> [,<file size>]" command to upload a file, the module will report "+QFUPL: <upload size>, <checksum>" information tips at the end of data transmission. Then MCU can judge whether the data has lost by comparing value of <upload size> and <checksum>.

<upload size> is the data length which the module received. MCU compares <upload size> and the actual length of the file. If unequal, it means the module lost data.

<checksum> is calculated by doing XOR for every 2 bytes. Similarly MCU calculates the actual file's checksum as below example, and then compares this value with <checksum> which module reports. If not equal, the received data may be problematic. User can re-upload data.

Example for calculating checksum:

If the uploaded file data length is 9, the 16 hex values are as follows:

0x23 0x13 0x65 0x B6 0x76 0x88 0xA3 0xEF 0x55

So, checksum is calculated as follows:

checksum = 0x2313 XOR 0x65B6 XOR 0x7688 XOR 0xA3EF XOR 0x5500

Every two data form a group and do XOR with another group. If the last group is less than 2 bytes, supplement with 0x00.

Similarly, the module will report the "+QFDWL: <download size>,<checksum>" information when command "AT+QFDWL=<file name>" is completed. <download size> is the actual size of downloaded data, MCU can calculate received data length, and compare it with <download size>. If not equal, the data is lost. MCU also can do checksum calculation and comparison with <checksum>, if not equal, need to re-download.

5. Examples

5.1. File uploading and downloading

```
AT+QFUPL="test.txt",3222 // Upload the text file "test.txt" to UFS
CONNECT
<input file bin data>
+QFUPL: 3222,B3E4

OK

AT+QFDWL="test.txt" // Download the file "test.txt" from UFS
CONNECT
<output file bin data>
+QFDWL: 3222,B3E4

OK

AT+QFUPL="RAM:test2.txt",4222 // Upload the text file "test2.txt" to RAM
CONNECT
<input file bin data>
+QFUPL: 4222,13E4

OK

AT+QFDWL="SD:pic1.jpg",13222 //Download the picture file "pic1.jpg" from SD card
CONNECT
<input file bin data>
+QFUPL: 13222,D5E4

OK
```

5.2. File moving

User can move file(s) among RAM, UFS and SD card by command "AT+QFMOV". Please remember user can not move file from UFS or SD card to RAM. Here list examples of moving single file and all files.

5.2.1. Move single file

```
AT+QFLST="RAM:*" //RAM has file "Pic.jpg"
+QFLST: "RAM:Pic.jpg",63388,75000

OK
AT+QFLST="*" //UFS also has one file "pic.jpg", but the file size is different
+QFLST: "pic.jpg",62076

OK
AT+QFMOV="RAM:pic.jpg","pic.jpg",1,0
+CME ERROR: 3921 //move file "pic.jpg" from RAM to UFS, "1" means
NOT deleting source file after file is copied,
"0" means "Do not overwrite the destination
file if it exists". Because the destination file has existed,
so it responses ERROR 3921 (File already existed).
The file is not moved. If user confirms the file can be
overwritten, set the last parameter as "1" as below.
AT+QFMOV="RAM:pic.jpg","pic.jpg",1,1 //Moving file successfully. The source file
"pic.jpg" in RAM is not deleted. The
destination file "pic.jpg" in UFS has been
overwritten,

OK
AT+QFLST="RAM:*"
+QFLST: "RAM:Pic.jpg",63388,75000

OK
AT+QFLST="*"
+QFLST: "pic.jpg",63388

OK
```

5.2.2. Move all files of one storage

```
AT+QFLST="RAM:*"
+QFLST: "RAM:pic0.jpg",59024,75000

+QFLST: "RAM:pic1.jpg",62592,75000

+QFLST: "RAM:pic2.jpg",57168,75000

+QFLST: "RAM:pic3.jpg",63216,75000

+QFLST: "RAM:pic4.jpg",64600,75000
```



```
+QFLST: "RAM:pic5.jpg",60284,75000

OK
AT+QFLST="SD:*"
OK
AT+QFMOV="RAM:*","SD:*",0,0
OK //Move all files in RAM to SD, the first "0" means
    deleting source files after files are copied, the
    second "0" means "Do not overwrite the destination
    file if it exists". SD has not these files, so the last
    parameter is meaningless in this case.

AT+QFLST="RAM:*" //Source files are deleted
OK
AT+QFLST="SD:*" //All files in RAM have been moved to SD card
+QFLST: "SD:pic0.jpg",59024

+QFLST: "SD:pic1.jpg",62592

+QFLST: "SD:pic2.jpg",57168

+QFLST: "SD:pic3.jpg",63216

+QFLST: "SD:pic4.jpg",64600

+QFLST: "SD:pic5.jpg",60284

OK
```

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