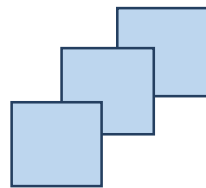


FIFOTRACK GPRS PROTOCOL




Model: A03

Version: V1.2

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Document History

Version	Revision Date	Author	Detail
V1.2	Feb 28, 2024	Vito Hu	Add “Moing/Stop” bit in A03.status and A10.status
V1.1	Apr 14, 2021	Vito Hu	Initial Version

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1 GPRS Package Format

GPRS uplink (i.e.: Data is sent from tracker to platform) command format:

\$\$<pack-len>,<ID>,<work-no>,<cmd-code>,<cmd-para>*<checksum>\r\n

GPRS downlink (i.e.: Data is sent form platform to tracker) command format:

##<pack-len>,<ID>,<work-no>,<cmd-code>,<cmd-para>*<checksum>\r\n

Remarks:

- ⊙ Comma (,) is used to separate data fields, and it is necessary. There is no space before or after comma.
- ⊙ pack-len: Package Length, decimal string format, the field of *pack-len* is {<ID>,<work-no>,<cmd-code>,<cmd-para>}, be careful, comma(,) in front of *ID* included.
- ⊙ ID: Tracker ID, default IMEI.
- ⊙ work-no: working number, hexadecimal string format, cyclic accumulation from 1 to 0xFFFF.
- ⊙ cmd-code: Command code, or specification of data type.
- ⊙ cmd-para: parameter or description of cmd-code, which is described in the following chapters.
- ⊙ checksum: checksum of package, 2 bytes hexadecimal string format, XOR of {<pack-len>,<ID>,<work-no>,<cmd-code>,<cmd-para>}.
- ⊙ \r\n: End of package, i.e. <CR><LF>.
- ⊙ Without specification, multi-byte binary data in cmd-para uses big endian format, i.e. Most Significant Byte first.

2 Applied Models

The document describes the format of position/alarm GPRS data, and it is applied for the following models:

- ⊙ Q2
- ⊙ Q3

3 GPS Position/Alarm Data Format – A03

\$\$<pack-len>,<ID>,<work-no>,A03,<alm-code>,<date-time>,MCC|MNC|LAC|CI,<bat-v>,<bat-level>,<status>,<loc-type>,<gps-info>/<wifi-info>*<checksum>\r\n

Descriptions of position/alarm data:

Example:

A03 supports two types of position data, GPS and WIFI, which is defined by *loc-type* field. Each position data type has similar format, but different *gps-info* or *wifi-info* field after *loc-type*

When *loc-type==0*, there is *gps-info* field in the position package, and field definition:

\$\$<pack-len>,<ID>,<work-no>,A03,<alm-code>,<date-time>,MCC|MNC|LAC|CI,<bat-v>,<bat-level>,<status>,0,<fix-flag>,<speed>,<salt-num>,<lat>,<lon>*<checksum>\r\n

Example as below:

\$\$95,866104023192332,1,A03,,210414055249,460|0|25FC|104C,4.18,100,000F,0,A,2,9,22.643175,114.018150*75\r\n

When *loc-type==1*, there is *wifi-info* in the position package, and field definition:

\$\$<pack-len>,<ID>,<work-no>,A03,<alm-code>,<date-time>,MCC|MNC|LAC|CI,<bat-v>,<bat-level>,<status>,1,<wifi-ap1>|<wifi-ap2>...|<wifi-apN>*<checksum>\r\n

Example as below:

\$\$136,866104023192332,1,A03,,210414055249,460|0|25FC|104C,4.18,100,000F,1,94D9B377EB53:-60|EC6C9FA4CAD8:-55|CA50E9206252:-61|54E061260A89:-51*3E\r\n

Field	pack-len
Description	decimal string format, the field of <i>pack-len</i> is {,<ID>,<work-no>,A03,<alm-code>,<date-time>,MCC MNC LAC CI,<bat-v>,<bat-percentage>,<status>,<loc-type>,<gps-info>/<wifi-info>}, be careful, comma(,) in front of <i>ID</i> included.
Example	95: the length of “,866104023192332,1,A03,,210414055249,460 0 25FC 104C,4.18,100,000F,0,A,2,9,22.643175,114.018150” 136: the length of “,866104023192332,1,A03,,210414055249,460 0 25FC 104C,4.18,100,000F,1,94D9B377EB53:-60 EC6C9FA4CAD8:-55 CA50E9206252:-61 54E061260A89:-51”
Field	ID
Description	Tracker ID, default IMEI, ASCII string
Example	866104023192332
Field	work-no
Description	working number, hexadecimal string format, cyclic accumulation from 1 to 0xFFFF
Example	1, indicates that the value of <i>work-no</i> is 0x0001
Field	A03

Description	Data type specification, which is used to define position/alarm package format.																			
Example																				
Field	alm-code																			
Description	Alarm code, refer to Appendix A ; For normal position data, this field is empty.																			
Example	Empty, the package is a normal position one.																			
Field	date-time																			
Description	GMT0 date & time, in format: YYMMDDHHmmss 01 YY: year since, 2 characters 02 MM: month, value range 1–12, 2 characters 03 DD: day, value range 1–31, 2 characters 04 HH: hour, value range 0–23, 2 characters 05 mm: minute, value range 0-59, 2 characters 06 ss: second, value range 0–59, 2 characters																			
Example	210414055249, means 2021-4-14 05:52:49 (@GMT0)																			
Field	MCC MNC LAC CI																			
Description	Mobil base station information. ' ' is used to separate each data. MCC, MNC: decimal string format LAC, CI: hexadecimal string format																			
Example	460 0 25FC 104C: Value of MCC is 460; Value of MNC is 0; Value of LAC is 0x25FC; Value of CI is 0x104C;																			
Field	bat-v																			
Description	Battery voltage, unit V																			
Example	4.18, means battery voltage 4.18V																			
Field	bat-level																			
Description	Battery level, unit %, 0~100%																			
Example	100, means battery level 100%																			
Field	status																			
Description	Alarm status or vehicle status, hexadecimal string format, as the following table: <table border="1"> <thead> <tr> <th>bit</th> <th>definition</th> <th>description</th> </tr> </thead> <tbody> <tr> <td>0–4</td> <td>CSQ</td> <td>GSM signal strength, range [0,31]</td> </tr> <tr> <td>5</td> <td>Charging</td> <td>Clear when charging cable plug out</td> </tr> <tr> <td>6</td> <td>Battery low</td> <td>Clear when battery normal, or charging cable plug in</td> </tr> <tr> <td>7</td> <td>Moving status</td> <td>0~Stop status; 1~Moving</td> </tr> <tr> <td>8–15</td> <td>Reserve</td> <td>Reserved for future use</td> </tr> </tbody> </table>		bit	definition	description	0–4	CSQ	GSM signal strength, range [0,31]	5	Charging	Clear when charging cable plug out	6	Battery low	Clear when battery normal, or charging cable plug in	7	Moving status	0~Stop status; 1~Moving	8–15	Reserve	Reserved for future use
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6	Battery low	Clear when battery normal, or charging cable plug in																		
7	Moving status	0~Stop status; 1~Moving																		
8–15	Reserve	Reserved for future use																		
Example	000F, means <u>CSQ==15</u>																			
Field	loc-type																			

Description	Position type, it defines GPS or WIFI position data type <i>loc-type==0</i> : GPS type, and <i>gps-info</i> define as <i><fix-flag></i> , <i><speed></i> , <i><sat-num></i> , <i><lat></i> , <i><lon></i>		
	field	definition	
	fix-flag	A—GPS fixed; V—GPS not fixed	
	Speed	Speed, unit km/h	
	sat-num	satellite number, update from GPS module data	
	lat	Latitude, negative in southern hemisphere, decimal string format	
	lon	Longitude, negative in western hemisphere, decimal string format	
	<i>loc-type==1</i> : WIFI type, and <i>wifi-info</i> defines as <i><wifi-ap1> <wifi-ap2>... <wifi-apN></i> , five WIFI APs supported maximally; <i>wifi-ap</i> format AABBCCDDEEFF:rsi, means MAC <i>AA:BB:CC:DD:EE:FF</i> , Received Signal Strength Indicator <i>rsi</i> , using ‘ ’ to separate various <i>wifi-ap</i> field		
Example	0: GPS type, “A,2,9,22.643175,114.018150” means GPS fixed, 2km/h, 9 satellites, position 22.643175 °,114.018150 °		
	1: WIFI type, “94D9B377EB53:-60 EC6C9FA4CAD8:-55 CA50E9206252:-61 54E061260A89:-51” means 4 WIFI APs searched, detail as below:		
	WIFI AP	MAC	RSSI
	94D9B377EB53:-60	94:D9:B3:77:EB:53	-60
	EC6C9FA4CAD8:-55	EC:6C:9F:A4:CA:D8	-55
	CA50E9206252:-61	CA:50:E9:20:62:52	-61
54E061260A89:-51	54:E0:61:26:0A:89	-51	
Field	checksum		
Description	checksum of package, 2 bytes hexadecimal string format, XOR of <i>{<pack-len></i> , <i><ID></i> , <i><work-no></i> , <i>A03</i> , <i><alm-code></i> , <i><date-time></i> , <i>MCC MNC LAC CI</i> , <i><bat-v></i> <i><bat-level></i> , <i><status></i> , <i><loc-type></i> , <i><gps-info></i> / <i><wifi-info></i> }.		
Example	75: XOR checksum of “95,866104023192332,1,A03,,210414055249,460 0 25FC 104C,4.18,100,000F,0,A,2,9,22.643175,114.018150”		
	3E: XOR checksum of “136,866104023192332,1,A03,,210414055249,460 0 25FC 104C,4.18,100,000F,1,94D9B377EB53:-60 EC6C9FA4CAD8:-55 CA50E9206252:-61 54E061260A89:-51”		
Field	\r\n		
Description	End of package, i.e. <CR><LF>		

Example	\r\n
---------	------

4 Server Response to A03

After receives A03 package, server should sending response package to device. Device resends A03 package every 1min when no response received.

Format of response package: ##<pack-len>,<ID>,<work-no>,A03,<date-time>*<checksum>\r\n

Descriptions of position/alarm data:

Example: ##35,866104023192332,1,A03,210414055250*44\r\n	
Field	pack-len
Description	decimal string format, the field of <i>pack-len</i> is {,<ID>,<work-no>,A03,<date-time>}, be careful, comma(,) in front of <i>ID</i> included.
Example	35: 35 bytes length of “,866104023192332,1,A03,210414055250”
Field	ID
Description	Tracker ID, default IMEI, ASCII string
Example	866104023192332
Field	work-no
Description	working number, hexadecimal string format, cyclic accumulation from 1 to 0xFFFF <i>work-no</i> in response package should be the same as uplink <i>A03</i> package; Device should compare <i>work-no</i> in response with uplink package, and deletes local <i>A03</i> package which has the same <i>work-no</i>
Example	1, indicates that the value of <i>work-no</i> is 0x0001, device deletes local GPRS package whose work-no is equal to 0x0001
Field	A03
Description	Data type specification, which defines response command code
Example	
Field	date-time
Description	GMT0 date & time, format: YYMMDDHHmmss 01 YY: year since 2000, 2 characters 02 MM: month, value range 1--12, 2 characters 03 DD: day, value range 1--31, 2 characters 04 HH: hour, value range 0--23, 2 characters 05 mm: minute, value range 0-59, 2 characters 06 ss: second, value range 0--59, 2 characters Device can use the <i>date-time</i> to calibrate local date and time
Example	210414055250: 2021-04-14 05:52:50
Field	checksum
Description	Checksum of package, 2 bytes hexadecimal string format, XOR of

	{<pack-len>,<ID>,<work-no>,A03,<date-time>}
Example	44 The XOR checksum is 0x44
Field	\r\n
Description	End of package, i.e. <CR><LF>
Example	\r\n

5 GPRS Heartbeat Data Format – A10

Heartbeat package is used to keep device online, under that condition, GPRS setting command can be delivered.

```
$$<pack-len>,<ID>,<work-no>,A10,<status>,<bat-ad>*<checksum>\r\n
```

Descriptions of position/alarm data:

Example: \$\$29,866104023192332,36,A10,0,190*5E\r\n			
Field	pack-len		
Description	decimal string format, the field of <i>pack-len</i> is {,<ID>,<work-no>,A10,<status>,<bat-ad>}, be careful, comma(,) in front of <i>ID</i> included.		
Example	29		
Field	ID		
Description	Tracker ID, default IMEI, ASCII string		
Example	866104023192332		
Field	work-no		
Description	working number, hexadecimal string format, cyclic accumulation from 1 to 0xFFFF		
Example	36, indicates that the value of <i>work-no</i> is 0x0036		
Field	A10		
Description	Data type specification, which is used to define GPRS heartbeat package format.		
Example			
Field	status		
Description	bit	definition	description
	0~4	Reserve	Reserved for future use
	5	Charging	Clear when charging cable plug out
	6	Battery low	Clear when battery normal, or charging cable plug in
	7	Moving status	0~Stop status; 1~Moving
	8—15	Reserve	Reserved for future use
Example			
Field	bat-ad		
Description	bat-ad: Voltage of internal battery, unit 0.01V		
Example	190: Voltage of battery is 0x01A0, i.e. 4.00V		
Field	checksum		

Description	Checksum of package, 2 bytes hexadecimal string format, XOR of {<pack-len>,<ID>,<work-no>,A10,<status>,<bat-ad>}
Example	5E The XOR checksum is 0x5E
Field	\r\n
Description	End of package, i.e. <CR><LF>
Example	\r\n

6 Server Response to A10

There is no response package from server to device.

Appendix A - Alarm Code

The following table describes the *alm-code* in GPS Position/Alarm data:

alm-code	Description	SMS Head String
2	Input1 active	SOS
17	Internal battery low	Low Battery
22	No Movement Alarm	No Movement
25	Tilt/Man Down	Tilt
31	Tilt	Tilt
33	Exit Fence	Exit Fence
34	Enter Fence	Enter Fence
53	Device Power ON	Power ON
54	Device Power OFF	Power OFF
55	Charging ON	Charging ON
56	Charging OFF	Charging OFF