GL521M Series @Track Air Interface

Safe Flight Manager Protocol

EGPRS/LTE Cat-M1/LTE Cat-NB2/GNSS Tracker

QSZTRACGL521MSFMAN0101

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0. Revision History

Version	Date	Author	Description of Change
1.00	2022-08-03	Leyfi Wang	Initial
1.01	2023-06-29	Leyfi Wang	Added <Gsensor Mode> to AT+GTSFM

1. Message

1.1. Safe Flight Manager

The **AT+GTSFM** command is used to control network communication module.

➢ **AT+ GTSFM**

Example: **AT+GTSFM=gl521m,1,30,10,1000,240,,3,0016$**			
Parameter	**Length (Byte)**	**Range/Format**	**Default**
Password	4 – 6	'0' – '9', 'a' – 'z', 'A' – 'Z'	gl521m
On Off Enable	1	0|1	0
Off Time	5	0 – 1440min	30
On Time	5	0 – 1440min	10
SF- Alt	<=8	(-)xxxxx.x m	1000
SF Speed	<=5	0.0 – 999.9km/h	200
Gsensor Mode	1	0|1	0
Open GPS Interval	2	3-1440min	3
Serial Number	4	0000 – FFFF	
Tail Character	1	$	$

✧ <On Off Enable>: Enable or disable "SFM" based functionality.

- 0: Disable
- 1: Enable

✧ <Off Time>: When "SFM" is enabled and the device fails to get GPS position for "Off Time" minutes, network communication module will be disabled. Before doing that, GL521M has to inform the server and report this to USB UART first. So it will need one minute more to make sure the report is sent. When it is set to 0, the network module will be deactivated immediately when the device fails to get GPS position. And the TROF message will be sent first, the other messages will be put into buffer when deactivated.

✧ <On Time>: If GPS signal is recovered and available for "On Time" minutes the network communication module can be activated again. This works in "AND" relation to "SF Alt" and "SF Speed" parameters. After network module is activated, it has to be reported to server and USB UART. When it is set to 0, network is activated immediately after first successful GPS fix (with respect to SF Alt and SF Speed settings). And the TRON message will be sent first, the other messages will be put into buffer.

✧ <SF Alt>: If GPS signal is available for "On Time" minutes and unit's altitude is lower than "SF Alt", network communication module can be activated. If it is set to 0, this condition will be ignored.

✧ <SF Speed>: If GPS signal is available for "On Time" minutes and unit's speed is lower than "SF Speed", then network communication module can be activated. If it is set to 0, this condition will be ignored.

✧ <Gsensor Mode>: Enable or disable the Gsensor mode. If it is enabled, device will only use the Gsensor to trigger the entering/exiting flight event. And all other settings will become invalid.

- 0: Disable
- 1: Enable

✧ <Open GPS Interval>: If SFM is enabled, the GPS will be turned on when <Open GPS Interval> arrives.

Note:

✧ Because GPS is on need, the judging result would not be very accurate. The SFM would be judged according to the GPS fix status in following ways:

- If <On Time> and <Off Time> settings are less than 3mins, the SFM judgment for the GPS fix would depend on the last GPS status when the GPS is off.
- If the <On Time> or <Off Time> settings are more than 3mins, and the SFM judgment for the GPS fix status would depend on the next GPS status when the GPS is on.

The acknowledgment message of the **AT+ GTSFM** command:

➢ **+ACK: GTSFM**

Example: **+ACK: GTSFM,020102,135790246811220,,0011,20101029085505,0028$**			
Parameter	**Length (byte)**	**Range/Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{'A'-'Z','0'-'9'}	
Unique ID	15	IMEI	
Device Name	10		
Serial Number	4	0000 – FFFF	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

1.1.1. Event Report

The following event reports are triggered when certain event occurs.

+RESP: GTROF: The report for deactivating network communication module.

+RESP: GTRON: The report for activating network communication module.

➢ **+RESP:GTROF:**

Example: **+RESP:GTROF,020102,135790246811220,,0,4.3,92,70.0,121.354335,31.222073,20090214013254,0460,0000,18d8,6141,00,20100214093254,11F0$**			
Parameter	**Length (byte)**	**Range/Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{'A'-'Z','0'-'9'}	
Unique ID	15	IMEI	
Device Name	10		
GPS Accuracy	1	0	
Speed	<=5	0.0 – 999.9km/h	
Azimuth	<=3	0 – 359	

Altitude	<=8	±XXXXX.X m	
Last Longitude	<=11	±XXX.XXXXXX	
Last Latitude	<=10	±XX.XXXXXX	
GPS UTC Time	14	YYYYMMDDHHMMSS	
MCC	4	0XXX	
MNC	4	0XXX	
LAC	4	XXXX	
Cell ID	4	XXXX	
Reserved	0		
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

✧ <Last longitude>: The longitude of the last position. The format is "(-)xxx.xxxxxx" and the value range is from "-180.000000" to "180.000000". The unit is degree. West longitude is defined as negative starting with minus "-" and east longitude is defined as positive without "+".

✧ <Last latitude>: The latitude of the last position. The format is "(-)xx.xxxxxx" and the value range is from "-90.000000" to "90.000000". The unit is degree. South Latitude is defined as negative starting with minus "-" and north Latitude is defined as positive without "+".

➢ **+RESP:GTRON:**

Example:
+RESP:GTRON,020102,135790246811220,0,,4.3,92,70.0,121.354335,31.222073,20090214013254,0460,0000,18d8,6141,00,20100214093254,11F0$

Parameter	Length (byte)	Range/Format	Default
Protocol version	6	XX0000 – XXFFFF, X∈{'A'-'Z','0'-'9'}	
Unique ID	15	IMEI	
Device name	10		
GPS accuracy	1	0|1 – 50	
Speed	<=5	0.0 – 999.9km/h	
Azimuth	<=3	0 – 359	
Altitude	<=8	±XXXXX.X m	
Last longitude	<=11	±XXX.XXXXXX	
Last latitude	<=10	±XX.XXXXXX	
GPS UTC time	14	YYYYMMDDHHMMSS	
MCC	4	0XXX	
MNC	4	0XXX	
LAC	4	XXXX	
Cell ID	4	XXXX	
Reserved	0		
Send time	14	YYYYMMDDHHMMSS	
Count number	4	0000 – FFFF	

Tail character	1	$	$