CV200 @Track Air Interface Protocol

Telematics Dual-Lens LTE CAT6 DASH CAM

QSZTRACCV200AN0210

Version: 2.10

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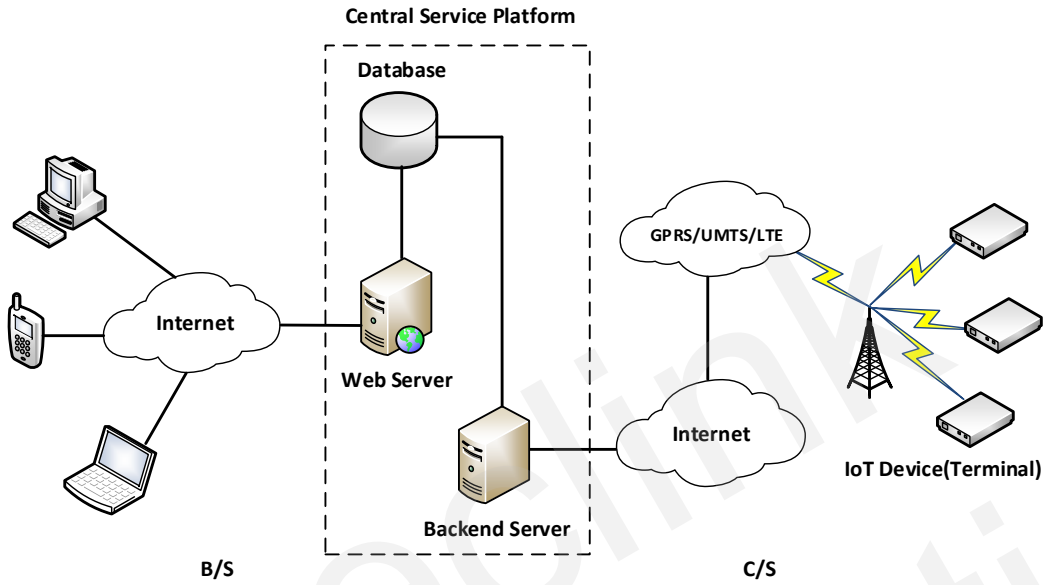
Contents

0. Revision History

Version	Date	Author	Description of Change
2.00	2021-04-13	Gino Li	Initial
2.01	2021-06-18	Gino Li	1. Modify the default value of <Ring Volume Levels> in AT+GTVOL to 1. 2. Add command AT+GTNVS for night vision setting. 3. +RESP:GTBTN is classified as <Position Related Report> instead of <Event Report>. 4. Add +RESP:GTPSG report.
2.02	2021-08-03	Gino Li	1. Add RTO-PSL sub command. 2. Add FTP Mode in AT+GTFTP. 3. Add TTS configuration in AT+GTVOL. 4. Add GNSS info in +RESP:GTOSI.
2.03	2021-09-28	Gino Li	1. Add +RESP:GTVDO report. 2. Add +RESP:GTSOD report. 3. Add RTO-VDO, RTO-SOD sub command 4. Change “Driver Camera” to “Interior Camera”.
2.04	2021-11-23	Gino Li	1. Add +RESP:GTDSA, +RESP:GTPIC, +RESP:GTRFQ 2. Add RTO-PIC, RTO-RFQ sub command. 3. Modify +RESP:GTBTN, and add “MAC” parameter. 4. Modify RTO-SOD, and add “Stream Type-Video File”, “Stream Type-Video Time Range”. 5. Modify AT+GTCFG, and add “Total Mileage” parameter.
2.05	2022-03-04	Gino Li	1. Add +RESP:GTFTP report. 2. Modify AT+GTOSD and add parameter “Speed Measurement”. 3. Modify AT+GTFTP and add parameter “Report FTP”. 4. Remove <Query Type>=1 Time range query in RTO-PIC. 5. Modify AT+GTVOL and add parameter “Voice Option”.
2.06	2022-06-08	Gino Li	1. In RTO-SOD, add Stream Type “3. Video Review”; add parameters “Start Time” and “End Time”; 2. In VOL – Voice Option, add “Polish”; 3. In +RESP:GTOSI, add parameter “Out Status”; 4. In AT+GTOSD, modify parameter “Date Format; 5. Add AT+GTPRS.
2.07	2022-08-12	Gino Li	1. Modify AT+GTHBM and it has only one threshold now.

			2. Modify AT+GTOSD and add OSD Time Offset. 3. Delete AT+GTNVS 4. Remove “REC – Frame Rate” parameter
2.08	2023-04-25	Daniel Yang	1. Modify AT+GTVOL and add driver status. 2. Add AT+GTDSS and +RESP:GTDSS. 3. Add RTO Sub Command 20 and 21. 4. Modify AT+GTWFS and add Ap band mode. 5. In +RESP:GTOSI, modify parameter “Recorder state” and “SIM Card state” and “Network state” 6. In +RESP:GTDSA, modify parameter “Alarm Type” 7. In AT+GTREC, modify parameter “Picture Event Mask" and “Picture Upload Mask”.
2.09	2023-06-09	Gino Li	1. Rename AT+GTFTP to AT+GTFSO and add AWS S3 parameters. 2. Add +RESP:GTAWS, and it is a similar function as +RESP:GTFTP. 3. Add RTO Sub Command 5 (Power Off). 4. Add 2.2.6.7 PPC Command. 5. Modify AT+GTCFG and remove parameter “Backup Battery Supply” and “Backup Battery Charge Mode”.
2.10	2023-07-18	Gino Li Daniel Yang	1. Add parameter “FrameRate” to AT+GTREC. 2. Add +RESP:GTVGN, +RESP:GTVGF (as same as +RESP:GTIGN, +RESP:GTIGF). 3. Add Bluetooth Settings include AT+GTBTS, AT+GTBAS, AT+GTBID. 4. Add +RESP:GTBAA, +RESP:GTBID. 5. Add +RESP:GTERI. 6. Add +RESP:GTBDS, +RESP:GTBCS. 7. Modify AT+GTFRI and add parameter “ERI Mask”. 8. Delete AT+GTBMK. 9. In AT+GTVOL, modify parameter “Voice Option”. 10. In AT+GTREC, modify parameter “Picture Event Mask" and “Picture Upload Mask”. 11. In AT+GTDSS, modify parameter “Event ID" and change range/format. 12. Add RTO-RLY sub command. 13. Add Serial Port Application, include AT+GTURT, AT+GTDAT. 14. Add +RESP:GTDAT. 15. Add AT+GTDIS and add +RESP:GTDIS. 16. Add AT+GTVMS.

1. System Architecture



The backend server needs to be accessible by many terminals and should have the following abilities:

- ✧ The backend server should be able to access the internet and listen for the connection originating from the terminal.
- ✧ The backend server should be able to support TCP or UDP connection with the terminal. It should be able to receive data from the terminal and send data to the terminal.
- ✧ The backend server should be able to receive and send SMS.

2. Message Description

2.1. Message Format

All of the @Track Air Interface Protocol messages are composed of printable ASCII characters. Message format which varies with message type is shown in the table below:

Message Format	Message Type
AT+GTXXX=<parameter1>,<parameter2>,…$	Command
+ACK:GTXXX,<parameter1>,<parameter2>,…$	Acknowledgement
+RESP:GTXXX,<parameter1>,<parameter2>,…$	Report

The entire message string ends with the character '$'.

The characters "XXX" allow the identification of the difference between messages.

The "<parameter1>,<parameter2>,…" carry the message's parameters. The number of parameters is different in different messages. The ASCII character ',' is used to separate the neighboring parameter characters. The parameter string may contain the following ASCII characters: '0'–'9', 'a'–'z', and 'A'–'Z'.

Detailed descriptions of each message format are available in the corresponding message sections.

By sending Commands to the terminal, the backend server can either configure and query the parameters of the terminal or control the terminal when it performs specific actions. When the terminal receives Commands over the air, it will reply with a corresponding Acknowledgement message.

According to the configuration of the parameters, the terminal can send Report messages to the backend server. Please see the following figure:

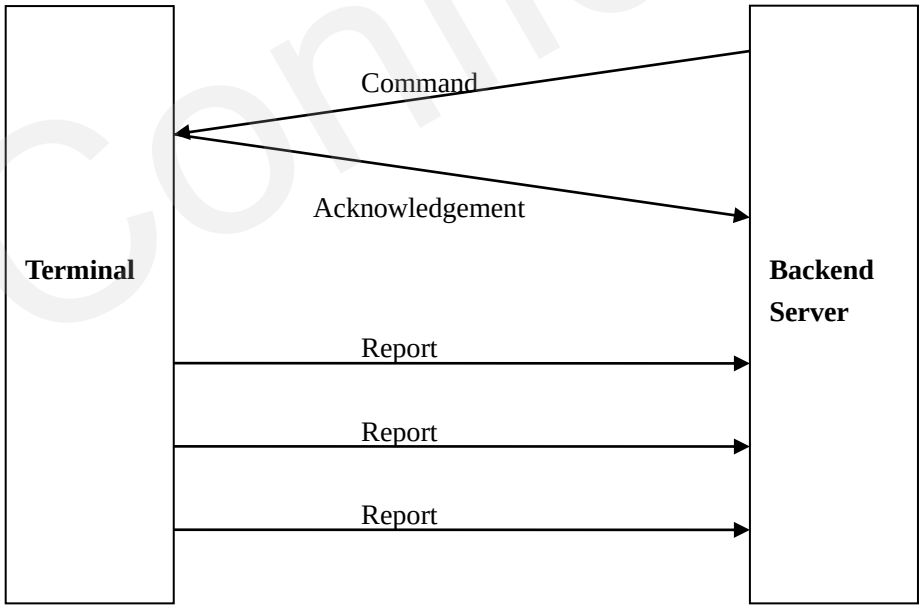


Figure 1: @Track Protocol Message Flow

2.2. Command and Acknowledgement

2.2.1.Server Connection

2.2.1.1. Bearer Setting Information

The command **AT+GTBSI** is used to configure the network parameters.

➢ **AT+GTBSI=**

Example: **AT+GTBSI=cv200,,,,,,,00,,,,,,,FFFF$**				
SN	**Parameter**	**Length (Byte)**	**Range/Format**	**Default**
1	Password	4 – 20	'0' – '9', 'a' – 'z', 'A' – 'Z'	**cv200**
2	APN	<=40	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '.'	
3	APN User Name	<=30		
4	APN Password	<=30		
5	Reserved			
6	Reserved			
7	Reserved			
8	Network Mode/APN Authentication Methods	1	00-33	00
9	Reserved			
10	Reserved	0		
11	Reserved	0		
12	Reserved	0		
13	Reserved	0		
14	Reserved	0		
	Serial Number	4	0000 – FFFF	
	Tail Character	1	$	$

✧ <*Password*>: The valid characters for the password include '0' – '9', 'a' – 'z', and 'A' – 'Z'. The default value is "**cv200**".

✧ <*APN*>: Access point name (APN).

✧ <*APN User Name*>: The APN user name. If the parameter field is empty, the current value of this parameter will be cleared.

✧ <*APN Password*>: The APN Password. If the parameter field is empty, the current value of this parameter will be cleared.

Note:

If there is only one APN, please use it as <*APN*>.

✧ <*Network Mode/APN Authentication Methods*>: This field is in hex format. 4 high bits mean APN Authentication Methods and 4 low bits mean Network Mode.

Mobile network modes of the device:

- 0: Auto. (LTE & WCDMA)

- 2: WCDMA Only.
- 3: LTE Only.

Mobile APN authentication methods of the device:

- 0: No authentication
- 1: PAP authentication
- 2: CHAP authentication
- 3: PAP or CHAP authentication

✧ <*Serial Number*>: The serial number of the command. It will be included in the ACK message of the command.

✧ <*Tail Character*>: A character which indicates the end of the command. And it must be '$'.

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

➢ **+ACK:GTBSI,**

Example: **+ACK:GTBSI,BD0200,868487004353181,cv200,0277,20210608104651,30C3$**			
Parameter	**Length (Byte)**	**Range/Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z', '0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Serial Number	4	0000 – FFFF	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

✧ <*Protocol Version*>: The protocol version that the terminal conforms to. The first two characters indicate the device type. As shown in the example above, "**BD**" means cv200. The middle two characters indicate the major version number of the protocol and the last two characters indicate the minor version number of the protocol. Both version numbers are hex digits. For example, "**0101**" means version 1.01.

✧ <*Unique ID*>: The IMEI of the terminal.

✧ <*Device Name*>: The specified name of the device.

✧ <*Serial Number*>: A serial number which is the same as the <*Serial Number*> in the corresponding command. It distinguishes which command the ACK message is for.

✧ <*Send Time*>: The local time to send the ACK message.

✧ <*Count Number*>: A self-increasing count number in each acknowledgment message and report message. It begins from 0000 and increases by 1 for each message. It rolls back after "FFFF".

✧ <*Tail Character*>: A character which indicates the end of the command. It must be '$'.

Note: Only after both the commands **AT+GTBSI** and **AT+GTSRI** are properly set can the ACK

messages and other report messages be sent to the backend server.

2.2.1.2. Backend Server Registration Information

The command **AT+GTSRI** is used to configure where and how to report all the messages, including the server information and the method of communication between the backend server and the terminal. If the terminal is configured correctly, it should be able to report data to the backend server.

➢ **AT+GTSRI=**

Example: **AT+GTSRI=cv200,7,,1,218.17.46.11,88,,0,,5,1,,1,,,FFFF$**				
SN	**Parameter**	**Length (Byte)**	**Range/Format**	**Default**
1	Password	4 – 20	'0' – '9' 'a' – 'z' 'A' – 'Z'	cv200
2	Report Mode	1	0 – 7	0
3	Reserved	0		
4	Buffer Mode	1	0|1|2	1
5	Main Server IP/ Domain Name	<=60		
6	Main Server Port	<=5	0 – 65535	
7	Backup Server IP/ Domain Name	<=60		
8	Backup Server Port	<=5	0 – 65535	
9	Reserved			
10	Heartbeat Interval	<=3	0|5 – 360min	0
11	SACK Enable	1	0|1|2	0
12	Reserved			
13	SMS ACK Enable	1	0|1	0
14	Reserved	0		
15	Reserved	0		
	Serial Number	4	0000 – FFFF	
	Tail Character	1	$	$

✧ <*Report Mode*>: This parameter defines the method of communication between the backend server and the terminal. Supported report modes are as follows:

- 0: Stop mode.
- 2: TCP short-connection mode. The connection is based on TCP protocol. The

terminal connects to the backend server every time it needs to send data and will shut down the connection when the terminal finishes sending data. When the terminal fails to establish TCP connection to the backend server (both Main Server and Backup Server), it will store the data in the memory buffer if the buffer report function is enabled. Otherwise the data is discarded.

- 4: UDP mode. The terminal will send data to the backend server by UDP protocol. Receiving protocol commands via UDP is supported if the network allows it. It is recommended to enable heartbeat sending and **+RESP:GTPDP** report in the case of receiving commands via UDP.
- 7: TCP long-connection mode with the backup server. The connection is based on TCP protocol. The terminal connects to the backend server and maintains the connection by using the heartbeat data. The backend server should respond to the heartbeat data from the terminals. If the main server is lost, it will try to connect the backup server. And if the backup server is also lost, it will try to connect the main server again.

Note: The connection will be interrupted when the terminal enters the sleep mode.

✧ <*Buffer Mode*>: The working mode of the buffer report function. If the buffer report function is enabled, and the device goes into areas without network coverage, the device will store all reports locally. If the device goes to areas with network coverage again, it will then send all the buffered reports through network.

- 0: Disable the buffer report function.
- 1: Low priority - Enable the buffer report function. In this mode, the device will send the buffered messages after sending real-time messages.
- 2: High priority - Enable the buffer report function. In this mode, the device will send all the buffered messages before sending real-time messages, except the SOS report (**+RESP:GTSOS**).

✧ <*Main Server IP/Domain Name*>: The IP address or the domain name of the primary server.

✧ <*Main Server Port*>: The port of the primary server.

✧ <*Backup Server IP/Domain Name*>: The IP address or the domain name of the backup server.

✧ <*Backup Server Port*>: The port of the backup server.

✧ <*Heartbeat Interval*>: The interval for sending the heartbeat message (**+ACK:GTHBD**) when the report mode is TCP long-connection mode or UDP mode. If it is set to 0, no heartbeat message will be sent.

✧ <*SACK Enable*>: This parameter defines whether the backend server should respond the terminal with a SACK message when it receives a message from the terminal.

- 0: The backend server does not reply a SACK message after receiving a message from the terminal.
- 1: The backend server replies a SACK message when it receives a message from the terminal.
- 2: The backend server replies a SACK message when receiving a message from the terminal, but the terminal does not check the serial number of the SACK message.

✧

✧ <*SMS ACK Enable*>: A numeral to indicate whether to send the acknowledgement message to the original number when the command is sent via SMS.

- 0: The device will send the acknowledgement message to the backend server according to the setting of <*Report Mode*>.
- 1: The device will send the acknowledgement message to the original number via SMS if the command is received via SMS.

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

➢ **+ACK:GTSRI,**

Example: **+ACK:GTSRI,BD0200,868487004353181,cv200,0279,20210608105039,30D7$**			
Parameter	**Length (Byte)**	**Range/Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z','0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Serial Number	4	0000 – FFFF	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

Note: Only after both the commands **AT+GTBSI** and **AT+GTSRI** are properly set can the ACK messages and other report messages be sent to the backend server.

2.2.2.Device Configuration

2.2.2.1. Global Configuration

The **AT+GTCFG** command is used to configure the global parameters.

➢ **AT+GTCFG=**

Example: **AT+GTCFG=cv200,,cv200,1,0,,,007F,1,,7FFF,,1,0,30,2,,,,400F,10,,FFFF$**				
SN	**Parameter**	**Length (Byte)**	**Range/Format**	**Default**
1	Password	4 – 20	'0' – '9' 'a' – 'z' 'A' – 'Z'	cv200
2	New Password	4 – 20	'0' – '9' 'a' – 'z' 'A' – 'Z'	
3	Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	CV200
4	ODO Enable	1	0|1	1
5	ODO Initial Mileage	<=9	0.0 – 4294967.0Km	0.0

6	Total Mileage	<=9	0.0 – 4294967.0Km	0.0
7	Reserved	0		
8	Composition Mask	4	0000– 007F	007F
9	Power Saving Mode	1	0 – 2	1
10	Reserved	0		
11	Event Mask	4	0000 – FFFF	FFFF
12	Reserved	0		
13	LED On	1	0|1	1
14	OSI Report Enable	1	0|1	1
15	OSI Report Interval	<=5	30 – 86400sec	300
16	Incoming Control	1	0|1|2|3|4	4
17	Reserved			
18	Reserved			
19	Reserved			
20	GSM Report	4	0000 – FFFF	000F
21	GNSS Lost Time	2	0 – 30 min	0
22	Reserved			
	Serial Number	4	0000 – FFFF	
	Tail Character	1	$	$

- <*New Password*>: It is used to change the current password.
- <*Device Name*>: An ASCII string which represents the name of the device.
- <*ODO Enable*>: Enable/disable the odograph function to calculate the total mileage. The current mileage is included in every position report message.
- <*ODO Initial Mileage*>: The initial value for calculating the total mileage.
- <*Total Mileage*>: Show the total mileage. (**Read Only**)
- <*Report Composition Mask*>: Bitwise mask to configure the composition of report messages, especially the composition of GNSS information.
  - Bit 0 for <*Speed*>
  - Bit 1 for <*Azimuth*>
  - Bit 2 for <*Altitude*>
  - Bit 3 for <*Cell Info Network Data*>, including <*MCC*>, <*MNC*>, <*LAC*>, <*Cell ID*> and the <*Reserved*> parameter value “00”
  - Bit 4 for <*Mileage*>
  - Bit 5 for <*Send Time*>, the time when the report is generated.
  - Bit 6 for <*Device Name*>

For each bit, set it to 1 to enable the corresponding component in the report, and 0 to disable the corresponding component in the report. This mask is valid for all report messages.

✧ <*Power Saving Mode*>: The mode of the power saving function. If <*Power Saving Mode*> is set to 0, the GNSS will be always on. If <*Power Saving Mode*> is set to 1, the fixed report, geo-fence report functions are suspended when the device is stationary or the engine is turned off. If <*Power Saving Mode*> is set to 2, it is mostly like Mode 1 and the difference is that the fixed report function will not be suspended and the fix and sending interval of it will be set to <*IGF Report Interval*> in **AT+GTFRI** when the engine is off.

- 0: Disable the power saving function.
- 1: GPS deep saving mode.
- 2: GPS low saving mode.

✧ <*Event Mask*>: Bitwise mask to configure which event report should be sent to the backend server.

- Bit 0 for **+RESP:GTPNA**
- Bit 1 for **+RESP:GTPFA**
- Bit 2 for **+RESP:GTMPN**
- Bit 3 for **+RESP:GTMPF**
- Bit 4 for **+RESP:GTDSA**
- Bit 5 for **+RESP:GTBPL**
- Bit 6 for **+RESP:GTBTC**
- Bit 7 for **+RESP:GTSTC**
- Bit 8 for **+RESP:GTSTT**
- Bit 9 Reserved
- Bit 10 for **+RESP:GTPDP**
- Bit 11 for the power on **+RESP:GTRTL**
- Bit 12 for the ignition report **+RESP:GTIGN/GTIGF/GTVGN/GTVGF**
- Bit 13 for the ignition on/off location report **+RESP:GTIGL**
- Bit 14 for **+RESP:GTBTN**
- Bit 15 for **+RESP:GTPSG**

For each bit, set it to 1 to enable the corresponding event report, and 0 to disable the corresponding event report.

✧ <*LED On*>: It configures the working mode of power LED, GNSS LED, network LED and record LED.

- 0: Each time the device powers on, all LEDs will work 30 minutes and then turn off (except REC LED).
- 1: All LEDs turn on as configured.

✧ <*OSI Report Enable*>: Enable/disable the device information report (**+RESP:GTOSI**).

- 0: Disable the device information report.
- 1: Enable the device information report

✧ <*OSI Report Interval*>: The interval for reporting the device information.

✧ <*Incoming Control*>: It configures how to handle the incoming call.

- 0: Just hang up the call.
- 1: Hang up the call and report the current position via **+RESP:GTLBC**.

- 2: Hang up the call and report the current position with a Google Maps link through SMS to the phone number of the incoming call.
- 3: Hang up the call and report the current position via **+RESP:GTLBC**, and simultaneously send a Google Maps link through SMS to the phone number of the incoming call.
- 4: Just answer the call.

✧ <*GSM Report*>: This field controls how or when to report cell information.

The 2 high bits, Bit 14 – 15, indicate GSM report mode.

- 0: Do not send **+RESP:GTGSM** report to server
- 1: Send **+RESP:GTGSM** report to server after positioning failed.

Bitwise mask to configure which event report should be sent to the backend server.

- Bit 0 for **+RESP:GTRTL**
- Bit 1 for **+RESP:GTLBC**
- Bit 2 for **+RESP:GTFRI**
- Bit 3 for **+RESP:GTSOS**
- Bit 5 – 13 Reserved

For each bit, set it to 1 to enable the corresponding event report, and 0 to disable the corresponding event report.

✧ <*GNSS Lost Time*>: A time parameter to monitor the GNSS signal. If there is no GNSS signal or no successful GNSS fix for consecutive <*GNSS Lost Time*>, the device will send the event report **+RESP:GTGSS** to indicate "GNSS signal lost". When the GNSS signal is recovered or a successful fix is obtained again, the device will send the event report **+RESP:GTGSS** to indicate the recovery. 0 means "Disable this feature".

Note: If the device is rebooted, it will not report **+RESP:GTGSS** to indicate GNSS signal recovery even if it has reported **+RESP:GTGSS** to indicate "GNSS signal lost" before reboot.

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

➢ **+ACK:GTCFG,**

Example: **+ACK:GTCFG,BD0200,868487004353181,cv200,0280,20210608111421,313F$**			
Parameter	**Length (Byte)**	**Range/Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z','0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Serial Number	4	0000 – FFFF	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

2.2.2.2. Auto-unlock PIN

The command **AT+GTPIN** is used to configure the auto-unlock PIN function of the device. Some operators offer SIM card with PIN code protection by default. To make the device work with the PIN-protected SIM card, this command is used to configure the device to auto-unlock the SIM PIN with the preset PIN code.

➢ **AT+GTPIN=**

Example: **AT+GTPIN=cv200,0,,,,,,FFFF$**				
SN	**Parameter**	**Length (Byte)**	**Range/Format**	**Default**
1	Password	4 – 20	'0' – '9' 'a' – 'z' 'A' – 'Z'	cv200
2	Enable Auto-unlock PIN	1	0|1	0
3	PIN	4-8	'0'-'9'	
4	Reserved			
5	Reserved			
6	Reserved			
7	Reserved			
8	Reserved			
	Serial Number	4	0000 – FFFF	
	Tail Character	1	$	$

✧ <*Enable Auto-unlock PIN*>: Set it to 1 to enable the "Auto-unlock PIN" function, and 0 to disable the "Auto-unlock PIN" function.

✧ <*PIN*>: The PIN code used to unlock the SIM PIN.

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

➢ **+ACK:GTPIN,**

Example: **+ACK:GTPIN,BD0200,868487004353181,cv200,0281,20210608111513,3142$**			
Parameter	**Length (Byte)**	**Range/Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z', '0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Serial Number	4	0000 – FFFF	
Send Time	14	YYYYMMDDHHMMSS	

Count Number	4	0000 – FFFF	
Tail Character	1	$	$

2.2.2.3. Time Adjustment

The command **AT+GTTMA** is used to adjust the local time of the device remotely. Upon receiving this command, the device will set the time zone and daylight saving accordingly. Then it will use the given UTC time to adjust the local time based on the time zone and daylight saving settings. This command will also be a trigger for the device to start NTP or GNSS fix. After a successful NTP or GNSS fix, the device will update the local time using the UTC time again.

➢ **AT+ GTTMA =**

Example: **AT+GTTMA=cv200,+,8,0,0,20210608031550,time.windows.com,,,,FFFF$**				
SN	**Parameter**	**Length (Byte)**	**Range/Format**	**Default**
1	Password	4 – 20	'0' – '9' 'a' – 'z' 'A' – 'Z'	cv200
2	Sign	1	+|-	+
3	Hour Offset	<=2	0-12	0
4	Minute Offset	<=2	0-59	0
5	Daylight Saving	1	0|1	0
6	UTC Time	14	YYYYMMDDHHMMSS	
7	NTP Address	<= 40		time.windows.com
8	Reserved			
9	Reserved			
10	Reserved			
	Serial Number	4	0000 – FFFF	
	Tail Character	1	$	$

✧ <*Sign*>: It indicates the positive or negative offset of the local time from UTC time.
✧ <*Hour Offset*>: UTC offset in hours.
✧ <*Minute Offset*>: UTC offset in minutes.
✧ <*Daylight Saving*>: Enable/disable daylight saving time.
- 0: Disable daylight saving time.
- 1: Enable daylight saving time.

✧ <*UTC Time*>: UTC time to be used as local time.
✧ <*NTP Address*>: The server address used to calibrate the time. Default: time.windows.com

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

- **+ACK:GTTMA,**

Example: **+ACK:GTTMA,BD0200,868487004353181,cv200,0282,20210608111622,314A$**			
Parameter	**Length (Byte)**	**Range/Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z', '0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Serial Number	4	0000 – FFFF	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

2.2.2.4. Protocol Watchdog

The **AT+GTDOG** command is used to reboot the device in a time based manner. This helps the device avoid working in an abnormal status for a long time.

- **AT+GTDOG=**

Example: **AT+GTDOG=cv200,1,,1,0200,,1,,,,,,FFFF$**				
SN	**Parameter**	**Length (Byte)**	**Range/Format**	**Default**
1	Password	4 – 20	'0' – '9' 'a' – 'z' 'A' – 'Z'	cv200
2	Mode	1	0|1	1
3	Reserved			
4	Reboot Interval	<=2	1 – 30 day	7
5	Reboot Time	4	HHMM	0200
6	Reserved	0		
7	Report Before Reboot	1	0|1	1
8	Reserved	0		
9	Reserved	0		
10	Reserved	0		
11	Reserved	0		

12	Reserved	0		
	Serial Number	4	0000 – FFFF	
	Tail Character	1	$	$

- ✧ <*Mode*>: The working mode of this function.
  - 0: Disable this function.
  - 1: Reboot periodically according to the <*Reboot Interval*> and <*Reboot Time*> settings.
- ✧ <*Reboot Interval*>: The interval for rebooting the device. It is measured in days.
- ✧ <*Reboot Time*>: The time at which the reboot operation is performed when the <*Reboot Interval*> condition is met.
- ✧ <*Report Before Reboot*>: It specifies whether to report the **+RESP:GTDOG** message before reboot. 0 means "Do not report the **+RESP:GTDOG** message", and 1 means "Report the **+RESP:GTDOG** message". If this parameter is enabled, the device will initiate a real-time location fix before sending the message with the current location information.

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

➢ **+ACK:GTDOG,**

Example: **+ACK:GTDOG,BD0200,868487004353181,cv200,0283,20210608111715,314D$**			
Parameter	**Length (Byte)**	**Range/Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z', '0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Serial Number	4	0000 – FFFF	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

2.2.2.5. Settings for Preserving Device's Specified Logic States

The command **AT+GTPDS** is used to preserve logic states of the device before the CPU is reset or power down. The logic states of the device which vary depending on the value of <*Mask*> will be preserved or reset according to the <*Mode*> setting.

➢ **AT+GTPDS=**

Example: **AT+GTPDS=cv200,1,007F,,,,,,FFFF$**

SN	Parameter	Length (Byte)	Range/Format	Default
1	Password	4 – 20	'0' – '9' 'a' – 'z' 'A' – 'Z'	cv200
2	Mode	1	0|1|2	1
3	Mask	4	0000-FFFF	007F
4	Reserved			
5	Reserved			
6	Reserved			
7	Reserved			
8	Reserved			
9	Reserved			
	Serial Number	4	0000 – FFFF	
	Tail Character	1	$	$

✧ <*Mode*>: The working mode of preserving logic states of the device.

- 0: Disable this function.
- 1: Preserve logic states of the device according to the value of the <*Mask*>.
- 2: Reset all the logic states of the device listed in the <*Mask*> after receiving the command, and then preserve logic states of the device according to the value of the <*Mask*>.

✧ <*Mask*>: Bitwise mask to configure which device status will be preserved. Each bit represents a state.

- Bit 0: States of GEO
- Bit 1: Reserved
- Bit 2: Reserved
- Bit 3: Information of last known position
- Bit 4: State of ignition
- Bit 5: Reserved
- Bit 6: Reserved
- Bit 7: Reserved
- Bit 8: State of SSR
- Bit 9: State of main power
- Bit10: State of PEO

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

➢ **+ACK:GTPDS,**

Example: **+ACK:GTPDS,BD0200,868487004353181,cv200,0284,20210608111755,3152$**			
Parameter	**Length (Byte)**	**Range/Format**	**Default**

Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z', '0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Serial Number	4	0000 – FFFF	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

2.2.2.6. Settings for Wi-Fi

The command **AT+GTWFS** is used to set the Wi-Fi parameters.

➢ **AT+GTWFS=**

Example: **AT+GTWFS=cv200,1,queclink,12345678,queclink,12345678,,1,,,,FFFF$**				
SN	**Parameter**	**Length (Byte)**	**Range/Format**	**Default**
1	Password	4 – 20	'0' – '9' 'a' – 'z' 'A' – 'Z'	cv200
2	Mode	1	0|1|2	1
3	AP SSID	<=31	'0' – '9' 'a' – 'z' 'A' – 'Z' `~!@#%^&*()-_=+[{]}|/?;:'"<>.	queclink
4	AP PWD	8 – 63	'0' – '9' 'a' – 'z' 'A' – 'Z' `~!@#%^&*()-_=+[{]}|/?;:'"<>.	12345678
5	STA SSID	<=31	'0' – '9' 'a' – 'z' 'A' – 'Z' `~!@#%^&*()-_=+[{]}|/?;:'"<>.	queclink
6	STA PWD	8 – 63	'0' – '9' 'a' – 'z' 'A' – 'Z' `~!@#%^&*()-_=+[{]}|/?;:'"<>.	12345678
7	Reserved			
8	AP Band Mode	1	1,2	1
9	Reserved			
10	Reserved			
11	Reserved			
	Serial Number	4	0000 – FFFF	

	Tail Character	1	$	$

✧ <*Mode*>: It is to disable/enable Wi-Fi function button.
- 0: Disable Wi-Fi function button.
- 1: Access point: It is used to allow terminals such as mobile phones, tablets or other IoT devices to connect to network via Wi-Fi of the camera.
- 2: STA: The camera connects to the hotspot of the preset wireless router to connect to network.

✧ <AP *SSID*>: This field is used to set a new SSID string. If it is empty, it means no need to change the SSID.

✧ <AP *PWD*>: This field is used to set a new PSK string, at least 8 bytes in length.

✧ <*STA SSID*>: This field is used to set a new STA SSID string. If it is empty, it means no need to change the SSID.

✧ <*STA PWD*>: This field is used to set a new STA PWD string, at least 8 bytes in length.

✧ <AP Band Mode>: Specify the band mode when the terminal is working as a Wi-Fi AP.
- 1 - 2.4GHz Band.
- 2 - 5.0GHz Band.

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

➢ **+ACK:GTWFS,**

Example: **+ACK:GTWFS,BD0200,868487004353181,cv200,0285,20210608111850,3157$**			
Parameter	**Length (Byte)**	**Range/Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z', '0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Serial Number	4	0000 – FFFF	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

2.2.2.7. Settings for Volume

The command **AT+GTVOL** is used to set volume configuration.

➢ **AT+GTVOL =**

Example: **AT+GTVOL=cv200,3,3,1,0,,,,,,,,,,FFFF$**				
SN	**Parameter**	**Length (Byte)**	**Range/Format**	**Default**

1	Password	4 – 20	'0' – '9' 'a' – 'z' 'A' – 'Z'	cv200
2	Multimedia Volume Levels	1	0-3	2
3	Call Volume Levels	1	0-3	3
4	Ring Volume Levels	1	0-3	1
5	TTS Alerts Mask	<=4	0000-FFFF	3FF
6	Voice Option	<=2	0|1	0
7	Reserved	0		
8	Reserved	0		
9	Reserved	0		
10	Reserved	0		
11	Reserved	0		
12	Reserved	0		
13	Reserved	0		
14	Reserved	0		
15	Reserved	0		
16	Reserved	0		
	Serial Number	4	0000 – FFFF	
	Tail Character	1	$	$

- <*Multimedia Volume Levels*>: Volume level size for multimedia. When the level is 0, it means mute.
- <*Call Volume Levels*>: Volume level size for the call.
- <*Ring Volume Levels*>: Volume level size for the ringtone.
- <*TTS Alerts Mask*>: Configuration of TTS (TextToSpeech) alerts when following events occur. Setting the bit to 1 means to enable it and 0 means to disable it.

  Bit0: Crash detected notification
  Bit1: Overspeed notification
  Bit2: Harsh acceleration notification
  Bit3: Harsh braking notification
  Bit4: Harsh turning notification
  Bit5: Wi-Fi switch
  Bit6: Eyes close detection
  Bit7: Yawning detection
  Bit8: Distraction detection
  Bit9: Smoking detection

Bit10: Phone use detection

Bit11: Driver abnormal detection.

Bit12: IR blocking detection.

✧ <*Voice Option*>: Configuration of TTS language.

- 0: English.
- 1: Spanish

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

➢ **+ACK:GTVOL,**

Example: **+ACK:GTVOL,BD0200,868487004353181,cv200,0287,20210608111953,315D$**			
Parameter	**Length (Byte)**	**Range/Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z', '0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Serial Number	4	0000 – FFFF	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

2.2.2.8. Virtual Ignition Mode Selection

The command **AT+GTVMS** is used to configure the virtual ignition mode if the hard-wired ignition wire is not connected. When the virtual ignition event was triggered, it will send **+RESP: GTVGN** or **+RESP: GTVGF** to backend server.

➢ **AT+GTVMS=**

Example: **AT+GTVMS=cv200,1,,,,,000B$**				
SN	**Parameter**	**Length (byte)**	**Range/Format**	**Default**
1	Password	4 - 20	'0' – '9' 'a' – 'z' 'A' – 'Z'	**cv200**
2	Virtual Ignition Mode	1	0|1	0
3	Reserved	0		
4	Reserved	0		
5	Reserved	0		
6	Reserved	0		

	Serial Number	4	0000 – FFFF	
	Tail Character	1	$	$

✧ <Virtual Ignition Mode>: A numeric to define the working mode for detecting ignition state virtually.

- 0: Disable the function, check ignition state by hardware wire.
- 1: Check virtual ignition state

The acknowledgment message of **AT+GTVMS** command:

➢ **+ACK:GTVMS,**

Example: **+ACK:GTVMS,BD0209,862170019025640,,000B,20230511093254,11F0$**			
Parameter	**Length (Byte)**	**Range/Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z','0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Serial Number	4	0000 – FFFF	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

2.2.3.Position Related Report

2.2.3.1. Fixed Report Information

The command **AT+GTFRI** is used to configure the parameters of scheduled report (**+RESP:GTFRI**).

➢ **AT+GTFRI=**

Example: **AT+GTFRI=cv200,1,,,,,,30,30,,,,45,60,,,,,FFFF$**				
SN	**Parameter**	**Length (Byte)**	**Range/Format**	**Default**
1	Password	4 – 20	'0' – '9' 'a' – 'z' 'A' – 'Z'	cv200
2	Mode	1	0 – 1	1
3	Reserved			
4	Reserved			
5	Reserved	0		
6	Reserved	0		

7	Reserved	0		
8	Reserved	0	0	
9	Send Interval	<=5	5 – 86400 sec	30
10	Reserved	0		
11	Reserved	0		
12	Reserved	0		
13	Corner Report	<=3	0 – 180	0
14	IGF Report Interval	<=5	0|5 – 86400 sec	600
15	ERI Mask	8	00000000 – FFFFFFFF	00000000
16	Reserved	0		
17	Reserved	0		
18	Reserved	0		
	Serial Number	4	0000 – FFFF	
	Tail Character	1	$	$

- <*Mode*>: The working mode of the fixed report function.
  - 0: Disable this function.
  - 1: Fixed Time Report. The position report message is sent to the backend server periodically according to the parameter <*Send Interval*>.
- <*Send Interval*>: The time interval for sending the position information. The value range is 5 – 86400 and the unit is second.
- <*Corner Report*>: The threshold to determine whether the device is turning around a corner. 0 means "Disable the corner report". For other values, the device will compare the current azimuth with that around the last known corner. If the difference is greater than or equal to this specific non-zero value, the device will send the corner report by **+RESP:GTFRI**.
- <*IGF Report Interval*>: The time interval for acquiring and sending the position information when <*Power Saving Mode*> in **AT+GTCFG** is set to 0|2 and the engine is off. If <*IGF Report Interval*> is less than 60 seconds, the GNSS will be always on. Its value range is 0|5 – 86400 and the unit is second.

  Note: If the <*Mode*> is not 0 and <*Power Saving Mode*> in **AT+GTCFG** is set to 0 or 2, the message **+RESP:GTFRI** will be sent to the backend server periodically according to the parameter <*IGF Report Interval*> when the engine is off.
- <*ERI Mask*>: When the device is connected with a peripheral, and the bit for the peripheral is set to 1, the device will report **+RESP:GTERI** instead of **+RESP:GTFRI**. This mask is used to configure whether to report the data from peripherals via **+RESP:GTERI**.
  - Bit 0 Reserved
  - Bit 1 Reserved
  - Bit 2 Reserved

- Bit 3 Reserved
- Bit 4 Reserved
- Bit 5 – Bit 6 Reserved.
- Bit 7 Reserved
- Bit 8 for the <*Bluetooth Accessory Data*> field in **+RESP:GTERI.**
- Bit 9 Reserved

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

➢ **+ACK:GTFRI,**

Example: **+ACK:GTFRI,BD0200,868487004353181,cv200,0288,20210608112245,3169$**			
Parameter	**Length (Byte)**	**Range/Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z', '0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Serial Number	4	0000 – FFFF	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

2.2.4.Alarm Settings

2.2.4.1. Geo-fence Information

The command **AT+GTGEO** is used to configure the Geo-fence parameters. (Geo-fence is a virtual perimeter around a geographic area using a location-based service. When the geo-fencing terminal enters or exits the area, a notification is generated. The notification contains information about the location of the terminal and can be sent to the backend server.)

➢ **AT+GTGEO=**

Example: **AT+GTGEO=cv200,0,0,0,0,50,0,,,,,0,0,,,FFFF$**				
SN	**Parameter**	**Length (Byte)**	**Range/Format**	**Default**
1	Password	4 – 20	'0' – '9' 'a' – 'z' 'A' – 'Z'	cv200
2	GEO ID	<=2	0 – 19	
3	Mode	1	0 – 3	0
4	Longitude	<=11	-180 - 180	

5	Latitude	<=10	-90 - 90	
6	Radius	<=7	50 – 6000000 m	50
7	Check Interval	<=5	0|5 – 86400 sec	0
8	Reserved	0		
9	Reserved	0		
10	Reserved	0		
11	Reserved	0		
12	Reserved	0		
13	Reserved	0		
14	Reserved	0		
15	Reserved	0		
	Serial Number	4	0000 – FFFF	
	Tail Character	1	$	$

- <*GEO ID*>: The ID of the Geo-fence. A total 20 zones (0 – 19) are supported.
- <*Mode*>: The working mode of reporting the Geo-fence message **+RESP:GTGIN/+RESP:GTGOT** to the backend server.
  - 0: Disable the zone's Geo-fence function.
  - 1: Entering the zone. Device will send report **+RESP:GTGIN** to the server when it detects that vehicle enters the Geo-fence area.
  - 2: Exiting the zone. Device will send report **+RESP:GTGOT** to the server when it detects that vehicle exits the Geo-fence area.
  - 3: Both entering and exiting the zone.
- <*Longitude*>: The longitude of a point which is defined as the center of the circular Geo-fence region. The unit is degree, and accuracy is in 6 decimal places. West longitude is defined as negative starting with the minus sign "–" and east longitude is defined as positive without "+".
- <*Latitude*>: The latitude of a point which is defined as the center of the circular Geo-fence region. The unit is degree, and accuracy is in 6 decimal places. South latitude is defined as negative starting with the minus sign "–" and north latitude is defined as positive without "+".
- <*Radius*>: The radius of the circular Geo-fence region. The value range is (50 – 6000000) and the unit is meter.
- <*Check Interval*>: The interval for the GNSS checking position information against the Geo-fence alarm.

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

- **+ACK:GTGEO,**

Example: **+ACK:GTGEO,BD0200,868487004353181,cv200,0,0365,20210608114431,31D8$**			
Parameter	**Length (Byte)**	**Range/Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z', '0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
GEO ID	<=2	0 – 19	
Serial Number	4	0000 – FFFF	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

2.2.4.2. Polygon Geo-fence

The command **AT+GTPEO** is used to configure the parameters of the virtual Polygon Geo-fence. If this function is enabled, the device will send a report **+RESP:GTGIN/+RESP:GTGOT** to the server when the device detects that it enters or exits the area. The device can support up to 20 Polygon Geo-fences.

➢ **AT+GTPEO=**

Example: **AT+GTPEO=cv200,0,0,1,3,0.000000,0.000000,0.000000,0.000000,0.000000,0.000000,0,,,,,,,,,FFFF$**				
SN	**Parameter**	**Length (Byte)**	**Range/Format**	**Default**
1	Password	4 – 7	'0' – '9' 'a' – 'z' 'A' – 'Z'	cv200
2	PEO ID	<=2	0 – 19	0
3	Mode	1	0 – 3	0
4	Start Point	<=2	0-10	1
5	End Point	<=2	3-10	3
5+2N-1	Longitude	<=11	(–)xxx.xxxxxx	
5+2N	Latitude	<=10	(–)xx.xxxxxx	
6+2N	Check Interval	<=5	0/5 – 86400sec	0
7+2N	Reserved	0		
8+2N	Reserved	0		

9+2N	Reserved	0		
10+2N	Reserved	0		
11+2N	Reserved	0		
12+2N	Reserved	0		
13+2N	Reserved	0		
14+2N	Reserved	0		
	Serial Number	4	0000 – FFFF	
	Tail Character	1	$	$

- ✧ <PEO ID>: ID of the Polygon Geo-fence. Total twenty zones, 0 to 19, are supported.
- ✧ <Mode>: The working mode of the polygon Geo-fence to report **+RESP:GTGIN** or **+RESP:GTGOT** to the server.
  - 0: Disable.
  - 1: Entering the zone. Device will send report **+RESP:GTGIN** to the server when it detects that vehicle enters the Geo-fence area.
  - 2: Exiting the zone. Device will send report **+RESP:GTGOT** to the server when it detects that vehicle exits the Geo-fence area.
  - 3: Both entering and exiting.
- ✧ <Start Point>: The starting coordinate of the polygon Geo-fence.
- ✧ <End Point>: The ending coordinate of the polygon Geo-fence
- ✧ <Longitude>: The node coordinate of the polygon Geo-fence. 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 value starting with "–" and east longitude is defined as positive without "+".
- ✧ <Latitude>: The node coordinate of the polygon Geo-fence. 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 value starting with "–" and north Latitude is defined as positive without "+".

Note: If more groups of <Longitude>and <Latitude> are needed, please use <Start Point> and <End Point> to adjust.

<Check Interval>: The checking interval for the Geo-fence alarm. 0 means to disable Geo-fence function.

The acknowledgment report of **AT+GTPEO** command:

➢ **+ACK:GTPEO,**

Example: **+ACK:GTPEO,BD0200,868487004353181,cv200,0,0370,20210608114713,31E3$**			
Parameter	**Length (Byte)**	**Range/Format**	**Default**

Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z', '0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
PEO ID	<=2	0 – 19	
Serial Number	4	0000 – FFFF	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

2.2.4.3. Over Speed Alarm

This command is used to set an over-speed alarm for the terminal. According to the working mode, the device will report the message **+RESP:GTOSP** to the backend server when its moving speed is over the range.

➢ **AT+GTOSP=**

Example: **AT+GTOSP=cv200,1,100,60,,,,,,,FFFF$**				
SN	**Parameter**	**Length (Byte)**	**Range/Format**	**Default**
1	Password	4 – 20	'0' – '9' 'a' – 'z' 'A' – 'Z'	cv200
2	Mode	1	0|1|2	0
3	Over Speed	<=3	0 – 200 km/h	60
4	Valid Time	<=4	0-3600 s	60
5	Reserved	0		
6	Reserved	0		
7	Reserved	0		
8	Reserved	0		
9	Reserved	0		
10	Reserved	0		
	Serial Number	4	0000 – FFFF	
	Tail Character	1	$	$

✧ <*Mode*>: The working mode of the over-speed alarm.

- 0: Disable over-speed alarm.
- 1: Enable over-speed alarm, but does not report the message **+RESP:GTOSP**.
- 2: Enable over-speed alarm and will report the message **+RESP:GTOSP**.

- ✧ <*Over Speed*>: The over speed limit.
- ✧ <*Valid Time*>: If the speed meets the alarm condition and is maintained for a period of time longer than the time that is specified by <Valid Time>, the **+RESP:GTOSP** will be triggered.

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

➢ **+ACK:GTOSP,**

Example: **+ACK:GTOSP,BD0200,868487004353181,cv200,0390,20210608115107,31FC$**			
Parameter	**Length (Byte)**	**Range/Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z', '0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Serial Number	4	0000 – FFFF	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

2.2.4.4. SOS Alarm

When an emergency occurs, the end user presses the function button for 3 seconds, or when <High Shock Sensitivity> is met, according the <Mode> in **AT+GTSOS** command, device can trigger reporting message **+RESP:GTSOS** to the backend server or dialing the SOS number.

➢ **AT+GTSOS=**

Example: **AT+GTSOS=cv200,3,,,,1,,,,,,,FFFF$**				
SN	**Parameter**	**Length (Byte)**	**Range/Format**	**Default**
1	Password	4 – 20	'0' – '9' 'a' – 'z' 'A' – 'Z'	cv200
2	Mode	1	0 – 4	0
3	Reserved	0		
4	SOS number	<=20		
5	SMS Gateway	<=20		
6	Auto Emergency Call	1	0|1	0
7	Reserved	0		
8	Reserved	0		

9	Reserved	0		
10	Reserved	0		
11	Reserved	0		
12	Reserved	0		
	Serial Number	4	0000 – FFFF	
	Tail Character	1	$	$

- <*Mode*>: The working mode of SOS Alarm.
  - 0: Disable function button for SOS alarm feature.
  - 1: Make the SOS call only.
  - 2: Send the **+RESP:GTSOS** to the backend server only.
  - 3: Send the **+RESP:GTSOS** to the backend server and then make the SOS call.
  - 4: Send the current position to the SMS gateway via SMS and send the **+RESP:GTSOS** to backend server.
- <*SOS number*>: The number to dial when user presses the function button for 3 seconds in emergency case.
- <*SMS Gateway*>: The number to send SMS to when user presses the function button for 3 seconds in emergency situation.
- <*Auto Emergency Call*>: When <High Shock Sensitivity> is met, to enable or disable the **AT+GTSOS** function. (Note: The AT+GTSOS alarm will be triggered automatically once the high shock event defined in AT+GTCRA feature occurs. The action of "emergency call" is up to the preset "Mode" option.)
  - 0: Disable.
  - 1: Enable.

The acknowledgment message of **AT+GTSOS** command:

- **+ACK:GTSOS,**

Example: **+ACK:GTSOS,BD0200,868487004353181,cv200,0391,20210608115231,31FD$**			
Parameter	**Length (Byte)**	**Range/Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z', '0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Serial Number	4	0000 – FFFF	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	

Tail Character	1	$	$

2.2.4.5. Excessive Idling Detection

The command **AT+GTIDL** is used to detect the engine excessive idling (the vehicle stays stationary while the ignition is on). When the device detects that the vehicle is entering into the idle status, it will report the event message **+RESP:GTIDN** to the backend server. When the vehicle leaves the idle status, the device will report the event message **+RESP:GTIDF** to the backend server.

➢ **AT+GTIDL=**

Example: **AT+GTIDL=cv200,0,2,1,0,,,,,,,,,,FFFF$**				
SN	**Parameter**	**Length (Byte)**	**Range/Format**	**Default**
1	Password	4 – 20	'0' – '9' 'a' – 'z' 'A' – 'Z'	cv200
2	Mode	1	0|1	0
3	Time to Idling	<=2	1 – 30 min	2
4	Time to Movement	1	1 – 5 min	1
5	Debounce Distance	<=4	0|100-9999m	0
6	Reserved	0		
7	Reserved	0		
8	Reserved	0		
9	Reserved	0		
10	Reserved	0		
11	Reserved	0		
12	Reserved	0		
13	Reserved	0		
14	Reserved	0		
15	Reserved	0		
16	Reserved	0		
	Serial Number	4	0000 – FFFF	
	Tail Character	1	$	$

✧ <*Mode*>: The working mode of the excessive idling detection function.

- 0: Disable this function.
- 1: Enable this function.

✧ <*Time to Idling*>: If it is detected that the vehicle is stationary with ignition on for the length

of time specified by this parameter, the vehicle is considered to be in idling status.

- ✧ <*Time to Movement*>: If the vehicle moves again and the moving state is maintained for the length of time specified by this parameter after it enters into idling status, it is considered to leave idling status. If ignition off is detected, the vehicle is considered to leave idling status regardless of the <*Time to Movement*> setting.
- ✧ <*Debounce Distance*>: If the vehicle moves more than <*Debounce Distance*> after it enters into idling status, the vehicle will be considered to leave idling status.

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

➢ **+ACK:GTIDL,**

Example: **+ACK:GTIDL,BD0200,868487004353181,cv200,0392,20210608115434,3200$**			
Parameter	**Length (Byte)**	**Range/Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z','0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Serial Number	4	0000 – FFFF	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

2.2.4.6. Start/Stop Report

The command **AT+GTSSR** is used to detect the status of vehicle (Start/Stop status). If the device detects that the vehicle is entering into Start status, it will report the event message **+RESP:GTSTR** to the backend server. If the vehicle leaves the Start status and then enters into Stop status, the device will report the event message **+RESP:GTSTP** to the backend server.

➢ **AT+GTSSR=**

Example: **AT+GTSSR=cv200,0,2,1,5,0,0,0,,FFFF$**				
SN	**Parameter**	**Length (Byte)**	**Range/Format**	**Default**
1	Password	4 – 20	'0' – '9' 'a' – 'z' 'A' – 'Z'	cv200
2	Mode	1	0|1	0
3	Time to Stop	<=4	(1– 30 min) | (5 – 1800 Sec)	2min
4	Time to Start	<=3	(1 – 5 min) | (5 – 300 Sec)	1min

5	Start Speed	2	1 – 10 Km/h	5
6	Long Stop	<=5	0 – 43200 min	0
7	Time Unit	1	0|1	0
8	Location Switch	1	0-1	0
9	Reserved	0		
	Serial Number	4	0000 – FFFF	
	Tail Character	1	$	$

- <*Mode*>: The working mode of the Start/Stop status report function.
  - 0: Disable this function.
    1: Enable this function.
- <*Time to Stop*>: Duration of static state is more than <Time to Stop>, the vehicle is considered to go into static state.
- <*Time to Start*>: Duration of movement state is more than <Time to Start>, the vehicle is considered to go into movement state.
- <*Start Speed*>: The threshold of start speed.
  - After successful GPS positioning, if the vehicle speed is more than <Start Speed> and the duration is longer than <Time to Start>, **+RESP:GTSTR** report will be sent to backend server; if the vehicle speed is less than <Start Speed> and the duration is longer than <Time to Stop>, **+RESP:GTSTP** report will be sent to backend server; if the duration is more than <Long Stop>, report **+RESP:GTLSP** will be sent to backend server.
  - When GPS fails to locate, device will not detect the vehicle speed. At this time, only built-in motion sensor detects the movement state. When the motion sensor detects that the vehicle is moving with ignition on and the duration is more than <Time to Start>, **+RESP:GTSTR** report will be sent to backend server. If device detects that vehicle is in static state and the duration is more than <Time to Stop>, **+RESP:GTSTP** report will be sent to backend server; if the duration is more than <Long Stop>, **+RESP:GTLSP** report will be to backend server.
- <*Long Stop*>: After the vehicle enters into Stop status and stays in the Stop status for a period of time longer than the time specified by this parameter, the message **+RESP:GTLSP** will be reported. 0 means “Disable this parameter”.
- <*Time Unit*>: It specifies the time unit of <*Time to Stop*> and <*Time to Start*> parameters.
  - 0: Minute
  - 1: Second
- <*Location Switch*>: It determines the position information (the last known GNSS position or real time GNSS position) to be included in the **+RESP:GTSTR** and **+RESP:GTSTP** report messages.
  - 0: Last known GNSS position
  - 1: Real time GNSS position

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

- **+ACK:GTSSR,**

Example: **+ACK:GTSSR,BD0200,868487004353181,cv200,0393,20210608115538,3204$**			
Parameter	**Length (Byte)**	**Range/Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z','0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Serial Number	4	0000 – FFFF	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

2.2.4.7. Harsh Behavior Monitoring

The command **AT+GTHBM** is used to monitor the harsh behavior of the driver with motion sensor. Two harsh behaviors will be monitored, the harsh braking and the harsh acceleration. The method to monitor the harsh behavior is by motion sensor. The function works when the engine is on and the vehicle is moving.

- **AT+GTHBM=**

Example: **AT+GTHBM=cv200,0,150,,,,50,150,,,,50,100,50,,,,,,,,,,FFFF$**				
SN	**Parameter**	**Length (Byte)**	**Range/Format**	**Default**
1	Password	4 – 20	'0' – '9' 'a' – 'z' 'A' – 'Z'	cv200
2	Mode	1	0 -1	0
3	Acceleration Threshold	<=3	100-1500(cm/s/s)	200
4	Reserved			
5	Reserved			
6	Reserved			
7	Acceleration Duration	<=2	10-50(*10ms)	50
8	Deceleration Threshold	<=3	100-1500(cm/s/s)	250
9	Reserved			
10	Reserved			
11	Reserved			

12	Deceleration Duration	<=2	10-50(*10ms)	40
13	Cornering Threshold	<=4	30-1500	50
14	Cornering Duration	<=3	10-50(*10ms)	50
15	Reserved	0		
16	Reserved	0		
17	Reserved	0		
18	Reserved	0		
19	Reserved	0		
20	Reserved	0		
21	Reserved	0		
22	Reserved	0		
23	Reserved	0		
24	Reserved	0		
	Serial Number	4	0000 – FFFF	
	Tail Character	1	$	$

- <*Mode*>: Working mode.
  - 0: Disable this function
  - 1: Enable this function.
- <*Acceleration Threshold*>: The threshold for harsh acceleration. The acceleration is greater than or equal to this value and the duration is greater than or equal to <Acceleration Duration>, a harsh acceleration is detected.
- <*Acceleration Duration*>: Please refer to <Acceleration Threshold>.
- <*Deceleration Threshold*>: The threshold for harsh braking. The deceleration is greater than or equal to this value and the duration is greater than or equal to <Deceleration Duration>, a harsh braking is detected.
- <*Deceleration Duration*>: Please refer to <Deceleration Threshold>.
- <*Cornering Threshold*>: The threshold for the motion sensor to measure whether the device is in cornering status.
- <*Cornering Duration*>: The time parameter to confirm that the device enters cornering status. The driving behavior must maintain for a period of time greater than the value defined by <Cornering Duration> so that cornering behavior event can be triggered.

Note: If device detected 2 or more than 2 times of the same driving behavior (harsh acceleration or harsh braking) within 10 seconds, it will report **+RESP:GTHBM** only one time.

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

- **+ACK:GTHBM,**

Example: **+ACK:GTHBM,BD0200,868487004353181,cv200,0394,20210608115652,3206$**			
Parameter	**Length (Byte)**	**Range/Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z','0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Serial Number	4	0000 – FFFF	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

2.2.4.8. Crash Detection

The command **AT+GTCRA** is used to configure the parameters for CRASH detection. If the detection condition is matched (i.e. the current acceleration in a direction is beyond the configured threshold), the device will report the **+RESP:GTCRA** event message and data packets **+RESP:GTCRD** to the backend server.

➢ **AT+GTCRA=**

Example: **AT+GTCRA=cv200,1,21,23,,0,500,500,,1,,1,30,30,FFFF$**				
SN	**Parameter**	**Length (Byte)**	**Range/Format**	**Default**
1	Password	4 – 20	'0' – '9' 'a' – 'z' 'A' – 'Z'	cv200
2	Mode	1	0-2	0
3	Crash Threshold	<=2	1 - 40	15
4	High Shock Sensitivity	<=2	Crash Threshold <= (X) <=40	23
5	Reserved	0		
6	Sampling Start	1	0|1	0
7	Samples Before Crash	4	1-1600	500
8	Samples After Crash	4	1-1600	500
9	Reserved			
10	Report Gyro Data	1	0 | 1	0
11	Reserved	0		

12	Add GNSS Data	1	0|1	0
13	GNSS Time Before Crash	3	0 – 120 seconds	30
14	GNSS Time After Crash	3	0 – 120 seconds	30
	Serial Number	4	0000 – FFFF	
	Tail Character	1	$	$

- <*Mode*>: The working mode of the crash detection function.
  - 0: Disable this function.
  - 1: Enable this function.
  - 2: In this mode, the acceleration sensor data will be converted in accordance with three axis self-calibration. In the new coordinate system, the positive X-axis points in the direction in which the vehicle travels, the positive Y-axis, which is perpendicular to X axis, points in such a way that the positive X-axis is right handed, and positive Z-axis is the opposite direction of gravity.

    Note: The device will keep monitoring crash event using the original three axis data from sensor until it detects the first **+RESP:GTASC** event.
- <*Crash Threshold*>: Threshold of the crash alarm. The smaller the number is, the more sensitive this function would be.
- <*High Shock Sensitivity*>: High shock sensitivity is the threshold value to detect a shock event stronger than crash. Its range: Crash Threshold <= High Shock Sensitivity <=40. In **AT+GTSOS,** if <*Auto Emergency Call*> is set to 1: Enable, when <*High Shock Sensitivity*> is met, **AT+GTSOS** function will be triggered.
- <*Sampling Start*>: A numeral to indicate the time to start sampling acceleration data.
  - 0: Start acceleration sampling after the device is powered on. The device will always collect acceleration information as long as the device is powered on.
  - 1: Start acceleration sampling after ignition on is detected. The device will collect acceleration information only in ignition on state.
- <*Samples Before Crash*>: When <*Report Gyro Data*> is 0, the value for this parameter represents the number of recorded XYZ-axis acceleration samples before crash. When <*Report Gyro Data*> is 1, this parameter value represents the number of recorded XYZ-axis acceleration and gyroscope data samples before crash.
- <*Samples After Crash*>: When <*Report Gyro Data*> is 0, the value for this parameter represents the number of recorded XYZ-axis acceleration samples after crash. When <*Report Gyro Data*> is 1, this parameter value represents the number of recorded XYZ-axis acceleration and gyroscope data samples after crash.
- <*Report Gyro Data*>: A numeral to indicate whether to include the sampling data of gyroscope in the message **+RESP:GTCRD**.
  - 0: Do not include gyroscope sampling data in the message **+RESP:GTCRD**.
  - 1: Include gyroscope sampling data in the message **+RESP:GTCRD**.
- <*Add GNSS Data*>: It determines whether to report GNSS data message **+RESP:GTPGR**. In

order to get enough GNSS data for reporting **+RESP:GTPGR**, the GNSS chip should be always on.

- 0: Do not report the **+RESP:GTPGR** message.
- 1: Report the **+RESP:GTPGR** message when the crash accident is detected.

✧ <*GNSS Time Before Crash*>: The time during which GNSS information is recorded before crash.

✧ <*GNSS Time After Crash*>: The time during which GNSS information is recorded after crash.

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

➢ **+ACK:GTCRA,**

Example: **+ACK:GTCRA,BD0200,868487004353181,cv200,0395,20210608115807,3209$**			
Parameter	**Length (Byte)**	**Range/Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z', '0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z'	
Serial Number	4	0000 – FFFF	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

2.2.4.9. Three Axis Self-Calibration

The command **AT+GTASC** is used to define the condition for calibrating the directions of accelerometer. When the condition is matched and the accelerometer calibration succeeds, the device will report the event message **+RESP:GTASC** which includes the calibration result to the backend server. The pre-condition for the calibration is ignition on and movement.

Note: It is strongly recommended to clear the self-calibration status of the acceleration data (via the sub command 25 (SCS) in **AT+GTRTO**) after the device is installed to avoid inaccuracy which may result from historical calibration data.

➢ **AT+GTASC=**

Example: **AT+GTASC=cv200,50,10,2,,,,,,,,,FFFF$**				
SN	**Parameter**	**Length (Byte)**	**Range/Format**	**Default**
1	Password	4 – 20	'0' – '9' 'a' – 'z' 'A' – 'Z'	cv200
2	Brake Speed Threshold	<=3	30 – 400km/h	30

3	Delta Speed Threshold	<=2	5 – 72km/h	5
4	Delta Heading Threshold	1	0-5	5
5	Reserved	0		
6	Reserved	0		
7	Reserved	0		
8	Reserved	0		
9	Reserved	0		
10	Reserved	0		
11	Reserved	0		
12	Reserved	0		
13	Reserved	0		
	Serial Number	4	0000 – FFFF	
	Tail Character	1	$	$

- <*Brake Speed Threshold*>: The lower threshold of the speed before braking. If the speed is above the threshold before braking, the braking event can trigger the three-axis accelerometer calibration.
- <*Delta Speed Threshold*>: The lower threshold of the delta speed in one second during braking. If the delta speed is above the threshold, the braking event can trigger the three-axis accelerometer calibration.
- <*Delta Heading Threshold*>: The upper threshold of the delta heading during braking. If the delta heading is smaller than the threshold, the braking event can trigger the three-axis accelerometer calibration.

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

- **+ACK:GTASC,**

Example: **+ACK:GTASC,BD0200,868487004353181,cv200,0396,20210608115846,320A$**			
Parameter	**Length (Byte)**	**Range/Format**	**Default**
Protocol Version	6	XX0000–XXFFFF, X ∈ {'A'–'Z','0'–'9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0'–'9' 'a'–'z' 'A'–'Z''-''_'	
Serial Number	4	0000–FFFF	

Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000–FFFF	
Tail Character	1	$	$

2.2.4.10. DSS Events Settings

The command **AT+GTDSS** is used to configure the general settings for driver safety system. Device can trigger reporting +RESP:GTDSS message to the backend server

➢ **AT+GTDSS=**

Example: **AT+GTDSS=cv200,1,1,10,3,100,,,1,,,,,FFFF$**				
SN	**Parameter**	**Length (Byte)**	**Range/Format**	**Default**
1	Password	4 – 20	'0' – '9' 'a' – 'z' 'A' – 'Z'	cv200
2	Event ID	1	1 – 7	
3	Mode	1	0 – 1	0
4	DMS Trigger Speed	<=3		
5	DMS Trigger Duration	<=2		
6	DMS Silent Duration	<=3		
7	Reserved	0		
8	Reserved	0		
9	Report Enable	1	0 – 1	1
10	Reserved	0		
11	Reserved	0		
12	Reserved	0		
13	Reserved	0		
	Serial Number	4	0000 – FFFF	
	Tail Character	1	$	$

✧ <Event *ID*>: Which event to configure.

- 1: Eye Close.
- 2: Yawning.
- 3: Distraction.
- 4: Smoking.
- 5: Phone Use.
- 6: Driver abnormal.

- 7: IR blocking.

✧ <*Mode*>: Specifies whether to enable the driver status monitoring feature.

- 0: Disable
- 1: Enable.

✧ <Trigger Speed>: Specify a speed threshold for triggering driver status event alarm. If the speed is lower than this value, the driver status event alarm of specified 'Event ID' will not be triggered. (It isn't accepted to configure the value to 0 for "distraction detection". Anyway, set the reasonable speed threshold after completing the camera installation, otherwise it will result a lot of invalid alarms)

✧ <Trigger Duration>: Specify a debounce time for driver status event detection. If the driver status event of specified 'Event ID' is detected and lasts for 'Trigger Duration', then the event alarm will be triggered.

✧ <Silent Duration>: Specify a duration for silencing the driver status event alarm. When an event alarm specified by 'Event ID' is triggered, it will automatically enter a silent duration during which the alarm event will not be triggered.

✧ <Report Enable>: It defines whether to report the message **+RESP:GTDSS**

The range/format values of the detection parameters for these events are shown below:

Event	Trigger Speed (km/h)	Trigger Duration (second)	Silent Duration (second)
Eye Close	0, 10-255	1-3	10-180
Yawning	0, 10-255	2-5	10-180
Distraction	30-255	3-5	10-180
Smoking	0, 10-255	2-5	10-180
Phone Use	0, 10-255	3-10	10-180
Driver abnormal	0, 10-255	5-10	10-180
IR blocking	0, 10-255	5-10	10-180

The default values of the detection parameters for these events are shown below:

Event	Trigger Speed (km/h)	Trigger Duration (second)	Silent Duration (second)
Eye Close	0	1	180
Yawning	0	2	180
Distraction	30	3	180
Smoking	0	2	180
Phone Use	0	3	180
Driver abnormal	0	10	180

Event	Trigger Speed (km/h)	Trigger Duration (second)	Silent Duration (second)
IR blocking	0	10	180

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

➢ **+ACK:GTDSS,**

Example: **+ACK:GTDSS,BD0200,868487004353181,cv200,1,0365,20210608114431,31D8$**			
Parameter	**Length (Byte)**	**Range/Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z', '0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Event ID	1	1 – 8	
Serial Number	4	0000 – FFFF	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

2.2.5.IO Application

2.2.5.1. Settings for Over-discharge Protection of Vehicle Battery

The command **AT+GTODP** is used to protect the vehicle battery to not over discharge. In ignition off status, if the device detects the vehicle battery voltage is lower than threshold voltage for a certain period of time, it will report **+RESP:GTODP** to the server and power off itself.

➢ **AT+GTODP =**

Example: **AT+GTODP=cv200,1,12000,6,,,,,FFFF$**				
SN	**Parameter**	**Length (Byte)**	**Range/Format**	**Default**
1	Password	4 – 20	'0' – '9' 'a' – 'z' 'A' – 'Z'	cv200
2	Mode	1	0|1	1
3	Voltage Threshold	<=5	8000-32000(mV)	11300
4	Debounce Time	2	1 – 6 (×10s)	6
5	Reserved	0		

6	Reserved	0		
7	Reserved	0		
8	Reserved	0		
9	Reserved	0		
	Serial Number	4	0000 – FFFF	
	Tail Character	1	$	$

✧ <Mode>: To disable or enable **AT+GTODP** function.

- 0: Disable
- 1: Enable

✧ <*Threshold Voltage*>: If the vehicle battery voltage is below the <*Threshold Voltage*>, the device will report **+RESP:GTODP** to the server and power off itself.

✧ <*Debounce Time*>: The vehicle battery voltage must be lower than <*Threshold Voltage*> for <*Debounce Time*> before the device reports **+RESP:GTODP** to the server and powers off itself to avoid false action due to sudden excessive voltage drop.

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

➢ **+ACK:GTODP,**

Example: **+ACK:GTODP,BD0200,868487004353181,cv200,0397,20210608115945,320D$**			
Parameter	**Length (Byte)**	**Range/Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z', '0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Serial Number	4	0000 – FFFF	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

2.2.5.2. Digital Input Port Settings

The command AT+GTDIS is used to configure the working mode and parameters of the digital input port of the terminal.

➢ **AT+GTDIS=**

Example: **AT+GTDIS=cv200,1,0,10,,,FFFF$**

SN	Parameter	Length (Byte)	Range/Format	Default
1	Password	4 – 20	'0' – '9''a' – 'z' 'A' – 'Z'	cv200
2	Input ID	1	1	
3	Mode	1	0, 1, 2 , 3	0
4	Validatity Time	<=4	1-3000 (*10 ms)	10
5	Reserved	0		
6	Reserved	0		
	Serial Number	4	0000 – FFFF	
	Tail Character	1	$	$

- ✧ <Input ID>:Indicates the digital input ID of terminal.
- ✧ <Mode>:This field indicates how the digital input port works. The terminal supports the following modes in total:
  - 0: - Disable. The status change of the digital input port will be ignored.
  - 1: - Report. When the status of the digital input port changes, there are no additional actions other than a **+RESP:GTDIS** report.
  - 2: - SOS. The state of the input port changes from Inactive to Active to indicate that SOS is triggered.
  - 3: - BTN. The state of the input port changes from Inactive to Active to indicate that BTN is triggered.
- ✧ <Validatity Time>: Input is considered valid only if the input level lasts as long as this field indicates.

The acknowledgment report of **AT+GTDIS** command:

- ➢ **+ACK:GTDIS,**

Example: **+ACK:GTDIS,BD0200,868487004353181,cv200,0400,20210608134423,3291$**			
Parameter	**Length (Byte)**	**Range/Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z', '0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Serial Number	4	0000 – FFFF	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

2.2.5.3. Digital Output Port Setting

The **AT+GTOUT** command is used to set specified output waveform from the digital output port.

Total four waveforms are supported as below. If it is set to waveform 1, the device will maintain this waveform at the specified output port after power on reset.

The output port will output square wave if it is set to waveform 4. The waveform will be output only when the main power supply is connected. The waveform will still be output even if the device is rebooted.

Waveform 1:

✓ <Duration> = 0ms, <Toggle Times> = 0

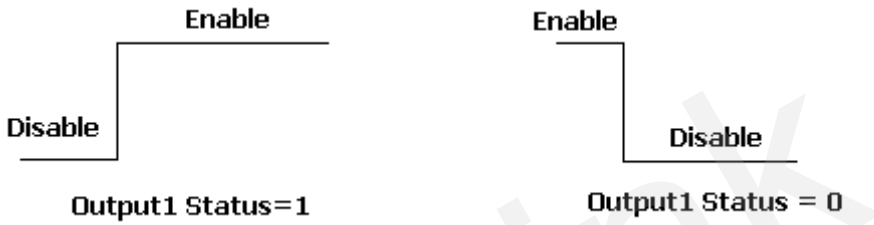


Figure 2: Waveform 1

Waveform 2:

✓ <Duration> = 500ms, <Toggle Times> = 1

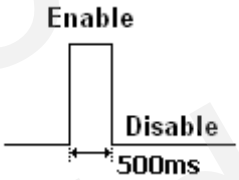


Figure 3: Waveform 2

Waveform 3:

✓ <Duration> = 800ms, <Toggle Times> = 3

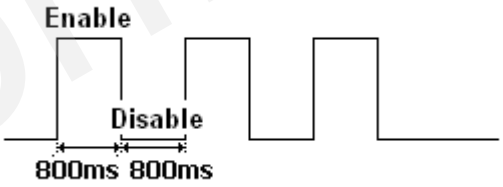


Figure 4: Waveform 3

Waveform 4:

✓ <Duration> = 800ms, <Toggle Times> = 0

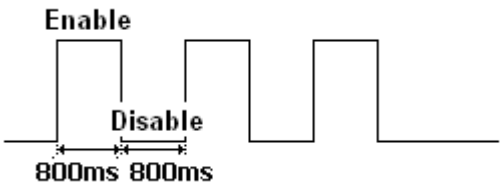


Figure 5: Waveform 4

➢ **AT+GTOUT=**

Example: **AT+GTOUT=cv200,0,0,0,,,,,,,,,,,,0,,,,,FFFF$**				
SN	**Parameter**	**Length (Byte)**	**Range/Format**	**Default**
1	Password	4 – 7	'0' – '9' 'a' – 'z' 'A' – 'Z'	cv200
2	Output1 Status	1	0 – 1	0
3	Duration	<=3	0 – 255(×100ms)	0
4	Toggle Times	<=3	0 – 255	0
5	Reserved	0		
6	Reserved	0		
7	Reserved	0		
8	Reserved	0		
9	Reserved	0		
10	Reserved	0		
11	Reserved	0		
12	Reserved	0		
13	Reserved	0		
14	Reserved	0		
15	Reserved	0		
16	Reserved	0		
17	Reserved	0		
18	Long Operation1	<=3	0 – 120min	0
19	Reserved	0		
20	Reserved	0		
21	Reserved	0		
22	Reserved	0		
	Serial Number	4	0000 – FFFF	
	Tail Character	1	$	$

✧ <Output1 Status>: Used only for the waveform 1 as shown in Figure 2 to set the final state of

the output port.

- 0: Disable state.
- 1: Enable state.

✧ <Duration>: Please refer to Figure 3, Figure 4 and Figure 5. Unit is 100ms.

✧ <Toggle Times>: Please refer to Figure 3, Figure 4 and Figure 5.
When the <Duration> is set to 0, the <Toggle Times> must be set to 0. Otherwise the command may be invalid.

✧ <Long Operation1>: The long operation time for output 1. After the long operation time, the output waveform will reset to the initial status at the specified output port. It would be effective only when the output waveform is 1 or 4.

The acknowledgment report of **AT+GTOUT** command:

➢ **+ACK:GTOUT,**

Example: **+ACK:GTOUT,BD0200,868487004353181,cv200,0398,20210608133805,328A$**			
Parameter	**Length (Byte)**	**Range/Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z','0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Serial Number	4	0000 – FFFF	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

2.2.5.4. Output Port Binding

This command is used to configure the user-defined output port action triggered by specified event. After the IO binding is set and corresponding condition occurs, the device will output specified waveform at the specified output port. Otherwise, the specified output port will restore to the initial status. The device will report **+RESP:GTOPB** to the server once the binding events are triggered.

➢ **AT+GTOPB=**

Example: **AT+GTOPB=cv200,,0,0000,,1,0,0,0,0,0,,,FFFF$**				
SN	**Parameter**	**Length (Byte)**	**Range/Format**	**Default**
1	Password	4 – 7	'0' – '9' 'a' – 'z' 'A' – 'Z'	cv200
2	Reserved			
3	Mode	1	0|1	0

4	Event Mask	2	0000 - FFFF	0000
5	Reserved	0		
6	Output ID	1	1	1
7	Output Status	1	0 - 1	0
8	Duration	<=3	0 – 255(×100ms)	0
9	Toggle Times	<=3	0 – 255	0
10	Long Operation	<=3	0 – 120min	0
11	OPB Report	1	0|1	1
12	Reserved	0		
13	Reserved	0		
	Serial Number	4	0000 – FFFF	
	Tail Character	1	$	$

- <*Mode*>: The working mode of the OPB
  - 0: Disable OPB function.
  - 1: Enable OPB function.
- <*Event Mask*>: Bitwise mask for trigger condition composition of the corresponding event. Each bit, from bit 0 to bit 14, represents the logical state of the corresponding input port to trigger the OPB event. Set it to 1 to use enabled state as the trigger condition and 0 to use disabled state. Only when the logical state of all the input ports in the IO binding meets the trigger condition will the OPB event be triggered.
  - Bit 0: Ignition on.
  - Bit 1: Ignition off.
  - Bit 2: Power disconnected.
  - Bit 3: Crash detection.
  - Bit 4: Harsh acceleration.
  - Bit 5: Harsh braking.
  - Bit 6: Harsh turning.
  - Bit 7: Over speed alarm.
  - Bit 8: Panic button clicking (panic event).
  - Bit 9: Panic button hold on (SOS alarm).
  - Bit 10: Reserved.
  - Bit 11: Reserved.
  - Bit 12: Reserved.
  - Bit 13: Geo (Peo)-fence.
  - Bit 14: Parking safeguard.
- <*Output Status*>: It is as same as the <*Output1 Status*> in **AT+GTOUT**.
- <*OPB Report*>: Enable/disable the **+RESP:GTOPB** reporting.
  - 0: Enable reporting.

- 1: Disable reporting.

The acknowledgment report of **AT+GTOPB** command:

➢ **+ACK:GTOPB,**

Example: **+ACK:GTOPB,BD0200,868487004353181,cv200,0400,20210608134423,3291$**			
Parameter	**Length (Byte)**	**Range/Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z', '0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Serial Number	4	0000 – FFFF	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

2.2.6.Serial Port Application

2.2.6.1. Serial Port Setting

The serial port of the device is used to connect with external devices to extend the application of the device. The command **AT+GTURT** is used to configure the working mode of the serial port for different external devices and the parameters for the serial port communication.

➢ **AT+GTURT=**

Example: **AT+GTURT=cv200,1,12,8,1,0,0,0,,,FFFF$**			
Parameter	**Length (Byte)**	**Range/Format**	**Default**
Password	4 – 20	'0' – '9' 'a' – 'z' 'A' – 'Z'	cv200
Working Mode	<=1	0 – 1	0
Baud Rate Index	<=2	1 – 12	12
Data Bits	1	7 – 8	8
Stop Bits	1	1 – 2	1
Parity Bits	1	0 – 2	0
Reserved	0		
Reserved	0		

Reserved	0		
Reserved	0		
Serial Number	4	0000 – FFFF	
Tail Character	1	$	$

✧ <*Working Mode*>: It configures the working mode of **AT+GTURT**.

- 0: Disable UART.
- 1: Use UART to transfer data via **AT+GTDAT** and other protocol commands. When the **AT+GTDAT** command is executed, the device will respond with the execution result to the second serial port. "OK" is returned when the command is executed successfully, and "Error" is returned when the command fails to be executed.

✧ <*Baud Rate Index*>: The index of the supported baud rate of the serial port. All supported baud rates are listed below:

Baud Rate Index	Baud Rate
1	1200
2	2400
3	4800
4	7200
5	9600
6	14400
7	19200
8	28800
9	33900
10	38400
11	57600
12	115200

✧ <*Data Bits*>: The data bits of the UART. The parameter value can be 7 or 8.

✧ <*Stop Bits*>: Stop bits of the UART. The parameter value can be 1, 2.

- 1: 1 Stop bit
- 2: 2 Stop bits

✧ <*Parity Bits*>: The parity bits of the UART. The parameter value can be 0, 1 or 2.

- 0: None parity
- 1: Odd parity
- 2: Even parity

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

➢ **+ACK:GTURT,**

Example: **+ACK:GTURT,BD0200,868487004353181,,0018,20090214093254,11F0$**			
Parameter	**Length (Byte)**	**Range/Format**	**Default**

Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z','0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Serial Number	4	0000 – FFFF	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

2.2.6.2. Transparent Data Transmission

The command **AT+GTDAT** is used to transfer data between the backend server and the equipment connected to the second serial port of the device. Data to the backend server is wrapped into the message **+RESP:GTDAT** and sent to the backend server while data to the equipment is directly output to the second serial port unrestricted by the @Track protocol. All data is transparent to the device.

Before this command is used, the **AT+GTURT** command should be used to set the parameters of the second serial port.

- **AT+GTDAT=**

Example: **AT+GTDAT=cv200,1,,data to the serial port,,,,,0017$**			
Parameter	**Length (Byte)**	**Range/Format**	**Default**
Password	4 – 20	'0' – '9' 'a' – 'z' 'A' – 'Z'	cv200
Command Type	1	0 – 3	
Reserved	0		
Data	<= 1280	ASCII Code	
Reserved	0		
Hex Convert	1	0|1	0
Reserved	0		
Reserved	0		
Serial Number	4	0000 – FFFF	
Tail Character	1	$	$

- ✧ <*Command Type*>: The command type which indicates how to send the data.
  - 0: Send message to the backend server with **+RESP:GTDAT (Short Format)**.
  - 1: Send the pure data directly to the serial port.
  - 2: Send message to the backend server with **+RESP:GTDAT (Long Format)**.
  - 3: Send the pure data directly to the serial port without CRLF.
- ✧ <*Data*>: Data to be transferred between the backend server and the equipment connected to the second serial port of the device. <*Data*> cannot include the character '$' if it will be sent to backend server while the value of <*Enable SACK*> in **AT+GTSRI** is 1.
- ✧ <*Hex Convert*>: If this parameter is set to 1, <*Data*> will be converted to hex format before sent to the serial port. This parameter is valid only when the <*Command Type*> is 1 or 3.

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

➢ **+ACK:GTDAT,**

Example: **+ACK:GTDAT,BD0200,868487004353181,,0017,20090214093254,11F0$**			
Parameter	**Length (Byte)**	**Range/Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z', '0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Serial Number	4	0000 – FFFF	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

2.2.7.Recorder Settings

2.2.7.1. Recorder Parameters Configuration

The command **AT+GTREC** is used to adjust the settings on the recorder.

➢ **AT+GTREC=**

Example: **AT+GTREC=cv200,1,03FF,03FF,1,2,,2,0,,1,0,03FF,03FF,,30,3,FFFF$**				
SN	**Parameter**	**Length (Byte)**	**Range/Format**	**Default**
1	Password	4 - 20	'0' – '9' 'a' – 'z' 'A' – 'Z'	cv200
2	Record Mode	1	0|1	1
3	Picture Event Mask	<=6	000000 - FFFFFF	000000
4	Video Event Mask	4	0000 - 63FF	6308

5	Record Audio	1	0|1	1
6	Video Quality of Front Camera	1	0|1|2	2
7	Reserved	0		
8	Video Quality of Interior Camera	1	0|1|2	2
9	Frame Rate	1	0|4	0
10	Reserved	0		
11	Interior Camera On	1	0|1	0
12	Recording Beep	1	0|1	0
13	Picture Upload Mask	<=6	000000 -FFFFFF	000000
14	Video Upload Mask	4	0000 - 63FF	6308
15	Reserved	0		
16	Event Recording Time	=2	10 - 30 seconds	30
17	Recording Time After Ignition Off	=1	3 – 5 minutes	3
18	Serial Number	4	0000 – FFFF	
	Tail Character	1	$	$

✧ <*Record Mode*>: Specifies the record mode of recorder.

- 0: Off. Turn off recorder.
- 1: Start recording when device detected ignition ON.

✧ <Picture *Event Mask*>: Bitwise mask to specify which event will trigger device to generate a specific picture file. For each bit, set it to 1 to enable the corresponding trigger event, and 0 to disable the corresponding trigger event.

If device detected one of selected events occurred, the front and interior cameras (When the <Interior Camera On> field is 1) will take pictures and store the photos locally.

- Bit 0: Ignition on.
- Bit 1: Ignition off.
- Bit 2: Power disconnected.
- Bit 3: Crash.
- Bit 4: Harsh acceleration.
- Bit 5: Harsh braking.
- Bit 6: Harsh turning.
- Bit 7: Over speed alarm.
- Bit 8: Panic button clicking (panic event).
- Bit 9: Panic button hold on (SOS alarm).
- Bit 10: Reserved.
- Bit 11: Reserved.

- Bit 12: Reserved.
- Bit 13: Geo (Peo)-fence.
- Bit 14: Parking safeguard.
- Bit 15: Reserved.
- Bit 16: Eyes close detection.
- Bit 17: Yawning detection.
- Bit 18: Distraction detection.
- Bit 19: Smoking detection.
- Bit 20: Phone use detection.
- Bit 21: Driver abnormal detection.
- Bit 22: IR blocking detection.

✧ <*Video Event Mask*>: Bitwise mask to specify which event will trigger device to generate a specific video file. For each bit, set it to 1 to enable the corresponding trigger event, and 0 to disable the corresponding trigger event.

If device detected one of selected events occurred, device will start the cameras and recording video for a time specified by <Event Recording Time> and store the video locally.

- Bit 0: Ignition on.
- Bit 1: Ignition off.
- Bit 2: Power disconnected.
- Bit 3: Crash.
- Bit 4: Harsh acceleration.
- Bit 5: Harsh braking.
- Bit 6: Harsh turning.
- Bit 7: Over speed alarm.
- Bit 8: Panic button clicking (panic event).
- Bit 9: Panic button hold on (SOS alarm).
- Bit 10: Reserved.
- Bit 11: Reserved.
- Bit 12: Reserved.
- Bit 13: Geo (Peo)-fence.
- Bit 14: Parking safeguard.

✧ <*Record Audio*>: Turn the audio recording on or off.

- 0: Off.
- 1: On.

✧ <Video Quality>: The quality rate of the video.

- 0: Low bitrate.
- 1: Medium bitrate.
- 2: High bitrate.

✧ <*Frame Rate*>: The frame rate of the video (front camera + interior camera).

- 0: 30 fps + 15 fps.
- 4: 15 fps + 15 fps.

✧ <*Interior Camera On*>: Specifies whether the interior camera is used.

- 0: Off.
- 1: On.

- <*Recording Beep*>: Specifies whether to beep when a certain event triggers starting recording or finishing recording.
  - 0: Off.
  - 1: On.
- <*Picture Upload Mask*>: Bitwise mask to specify which event triggers automatic upload of the specific picture. For each bit, set it to 1 to enable the corresponding trigger event, and 0 to disable the corresponding trigger event.
  - Bit 0: Ignition on.
  - Bit 1: Ignition off.
  - Bit 2: Power disconnected.
  - Bit 3: Crash.
  - Bit 4: Harsh acceleration.
  - Bit 5: Harsh braking.
  - Bit 6: Harsh turning.
  - Bit 7: Over speed alarm.
  - Bit 8: Panic button clicking (panic event).
  - Bit 9: Panic button hold on (SOS alarm).
  - Bit 10: Reserved.
  - Bit 11: Reserved.
  - Bit 12: Reserved.
  - Bit 13: Geo (Peo)-fence.
  - Bit 14: Parking safeguard.
  - Bit 15: Reserved.
  - Bit 16: Eyes close detection.
  - Bit 17: Yawning detection.
  - Bit 18: Distraction detection.
  - Bit 19: Smoking detection.
  - Bit 20: Phone use detection.
  - Bit 21: Driver abnormal detection.
  - Bit 22: IR blocking detection.
- <*Video Upload Mask*>: Bitwise mask to specify which events triggers automatic upload of the specific video. For each bit, set it to 1 to enable the corresponding trigger event, and 0 to disable the corresponding trigger event.
  - Bit 0: Ignition on.
  - Bit 1: Ignition off.
  - Bit 2: Power disconnected.
  - Bit 3: Crash.
  - Bit 4: Harsh acceleration.
  - Bit 5: Harsh braking.
  - Bit 6: Harsh turning.
  - Bit 7: Over speed alarm.
  - Bit 8: Panic button clicking (panic event).
  - Bit 9: Panic button hold on (SOS alarm).
  - Bit 10: Reserved.

- Bit 11: Reserved.
- Bit 12: Reserved.
- Bit 13: Geo (Peo)-fence.
- Bit 14: Parking safeguard.

✧ <*Event Recording Time*>: Specifies the duration of recording triggered by event. The unit is second. **Note:** Except ignition-on event, the duration of recording is composed by N seconds before the event and N seconds after the event; for ignition-on event, the duration of recording is composed by 2N seconds after the event. (N equals to <Event Recording Time> divided by 2).

✧ <*Recording Time after Ignition Off*>: After the device detects the ignition OFF exceeds the time specified by <*Recording Time After Ignition Off*>, the device will stop cameras and stop recording video.

Note: Video and photo files are named in the same format. The format is "YYYYMMDD_HHMMSS_Event Type_Camera ID" (such as 20210201_155646_04_1).

The values of the <Event Type> field are represented as follows:

- 00: None.
- 01: Ignition on.
- 02: Ignition off.
- 03: Power disconnected.
- 04: Crash.
- 05: Harsh acceleration.
- 06: Harsh braking.
- 07: Harsh turning.
- 08: Over speed alarm.
- 09: Panic button clicking (panic event).
- 0A: Panic button hold on (SOS alarm).
- 0E: Geo (Peo)-fence.
- 0F: Parking safeguard.
- D1: Eyes close detection.
- D2: Yawning detection.
- D3: Distraction detection.
- D4: Smoking detection.
- D5: Phone use detection.
- D6: Driver abnormal detection.
- D7: IR blocking detection.

The values of the <Camera ID> field are represented as follows:

- 1: Front camera.
- 2: Interior camera.

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

➢ **+ACK:GTREC,**

Example:
+ACK:GTREC,BD0200,868487004353181,cv200,0401,20210608141408,32AE$

Parameter	Length (Byte)	Range/Format	Default
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z', '0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Serial Number	4	0000 – FFFF	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

2.2.7.2. On-screen Display

The command **AT+GTOSD** is used to configure on-screen display.

➢ **AT+GTOSD=**

Example:
AT+GTOSD=cv200,0,12,0,,,,,FFFF$

SN	Parameter	Length (Byte)	Range/Format	Default
1	Password	4 - 20	'0' – '9' 'a' – 'z' 'A' – 'Z'	cv200
2	Date Format	1	0|1|2	0
3	Display Mask	2	00-FF	0x12
4	Speed Measurement	1	0|1	0
5	OSD Sign	1	+|-	+
6	OSD Hour Offset	<=2	0-12	0
7	OSD Minute Offset	<=2	0-59	0
8	OSD Daylight Saving	1	0|1	0
9	Reserved	0		
	Serial Number	4	0000 – FFFF	
	Tail Character	1	$	$

✧ <Date Format>: the date format:

- 0: YYYY-MM-DD hh:mm:ss
- 1: MM-DD-YYYY hh:mm:ss
- 2: DD-MM-YYYY hh:mm:ss

✧ <Display Mask>:

- Bit 0: show device name (Set in *AT+GTCFG*)
- Bit 1: show GPS coordinate
- Bit 2: show GPS azimuth
- Bit 3: show G-sensor data
- Bit 4: show speed

✧ <GPS Speed Measurement>:

- 0: kph
- 1: mph

✧ <OSD Sign>: It indicates the positive or negative offset of the OSD time from UTC time.

✧ <OSD Hour Offset>: Hour offset from UTC time for OSD time.

✧ <OSD Minute Offset>: Minute offset from UTC time for OSD time.

✧ <OSD Daylight Saving>: Enable/disable daylight saving of OSD time.

- 0: Disable
- 1: Enable

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

➢ **+ACK:GTOSD,**

Example: **+ACK:GTOSD,BD0200,868487004353181,cv200,0402,20210608141514,32AF$**			
Parameter	**Length (Byte)**	**Range/Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z', '0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Serial Number	4	0000 – FFFF	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

2.2.7.3. Server for Transferring Files

The command **AT+GTFSO** is used to configure the server for transferring files.

➢ **AT+GTFSO=**

Example: **AT+GTFSO=cv200,218.17.50.142,7060,TESTFOLODER,test,queclink#858,0,1,,,,,queclink,0,FFFF$**				
SN	**Parameter**	**Length (Byte)**	**Range/Format**	**Default**
1	Password	4 - 20	'0' – '9' 'a' – 'z' 'A' – 'Z'	cv200
2	FTP Server IP/Domain Name	< 40		

3	FTP Server Port	<=5	0 - 65535	21
4	Files Path	>0 & < 60	'0' – '9' 'a' – 'z' 'A' – 'Z' `~!@#%^&()-_=+[{]}/.	queclink
5	FTP Username	< 40	'0' – '9' 'a' – 'z' 'A' – 'Z' `~!@#%^&*()-_=+[{]}|/?;:'"<>.	
6	FTP Password	< 40	'0' – '9' 'a' – 'z' 'A' – 'Z' `~!@#%^&*()-_=+[{]}|/?;:'"<>.	
7	FTP Mode	1	0|1|2	0
8	File Report	1	0|1	0
9	AWS Access Key ID	<=40	'0' – '9' 'a' – 'z' 'A' – 'Z' `~!@#%^&*()-_=+[{]}|/?;:'"<>.	
10	AWS Secret Access Key	<= 40	'0' – '9' 'a' – 'z' 'A' – 'Z' `~!@#%^&*()-_=+[{]}|/?;:'"<>.	
11	AWS Bucket Name	< 40	'0' – '9' 'a' – 'z' 'A' – 'Z' `~!@#%^&*()-_=+[{]}|/?;:'"<>.	
12	AWS Region	< 40	'0' – '9' 'a' – 'z' 'A' – 'Z' `~!@#%^&*()-_=+[{]}|/?;:'"<>.	
13	AWS Files Path	< 60	'0' – '9' 'a' – 'z' 'A' – 'Z' `~!@#%^&()-_=+[{]}/.	queclink
14	Upload Mode	1	0|1	0
15	Serial Number	4	0000 – FFFF	
	Tail Character	1	$	$

- <*FTP Server IP/Domain Name*>: IP address or domain name of the FTP server. The video or photo recorded by the device will be uploaded to the FTP server via FTP. When the device needs a firmware upgrade, it will download the firmware from the FTP server.
- <*FTP Server Port*>: Specifies the port of the FTP server.
- <*Files Path*>: The storage path of the file on the FTP server.
- <*FTP Username*>: User name for accessing the FTP server.
- <*FTP Password*>: Password required to access the FTP server.
- <*FTP Mode*>: Specifies the mode of the FTP server. (The TLS certificate will not be downloaded and stored locally after secured connection established with FTP server.)

- 0: FTP The Default <*FTP Server Port*> is 21
- 1: FTPES The Default <*FTP Server Port*> is 21
- 2: FTPS The Default <*FTP Server Port*> is 990

✧ <*File Report*>: Send +RESP:GTFTP or +RESP:GTAWS report to the backend server after transferring a file.

- 0: Disable the report.
- 1: Enable the report

✧ <*AWS Access Key ID*>: Key ID for accessing the AWS server.

✧ <*AWS Secret Access Key*>: Secret access key required to access the AWS server.

✧ <*AWS Bucket Name*>: The name of AWS bucket

✧ <*AWS Region*>: The region of AWS server.

✧ <*AWS Files Path*>: The storage path of files on the AWS server.

✧ <*Upload Mode*>: Specify the upload mode:

- 0: FTP.
- 1: AWS S3

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

➢ **+ACK:GTFSO,**

Example: **+ACK:GTFSO,BD0200,868487004353181,cv200,0403,20210608141657,32B2$**			
Parameter	**Length (Byte)**	**Range/Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z', '0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Serial Number	4	0000 – FFFF	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

2.2.7.4. Space Assignment

The command **AT+GTSSA** is to assign space to store different kinds of videos and to set the storage behavior of the G-sensor data and GNSS data.

➢ **AT+GTSSA=**

Example: **AT+GTSSA=cv200,70,0,0,0,,,,,FFFF$**				
SN	**Parameter**	**Length (Byte)**	**Range/Format**	**Default**
1	Password	4 - 20	'0' – '9' 'a' – 'z' 'A' – 'Z'	cv200

2	Continuous Recording	2	50-100	70
3	Save G-sensor Data	1	0|1	0
4	Save GNSS Data	1	0|1	0
5	Data Overwrite Cycle	1	0|1|2|3	0
6	Reserved			
7	Reserved	0		
8	Reserved	0		
9	Reserved	0		
	Serial Number	4	0000 – FFFF	
	Tail Character	1	$	$

✧ *<Continuous Percent>*: It is to allocate X% space to the ordinary video. And the video space of event-based video is (100-X)%

✧ *<Save G-sensor Data>*: To save Accel &Gyro data or not.

- 0: OFF
- 1: ON

✧ *<Save GNSS Data>*: To save GNSS data or not.

- 0: OFF
- 1: ON

✧ *<Data Overwrite Cycle>*: The cycle to overwrite the saved G-sensor data and GNSS data.

- 0: 8 hours
- 1: 24 hours
- 2: 48 hours
- 3: 72 hours

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

➢ **+ACK:GTSSA,**

Example: **+ACK:GTSSA,BD0200,868487004353181,cv200,0404,20210608141837,32B5$**			
Parameter	**Length (Byte)**	**Range/Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z', '0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Serial Number	4	0000 – FFFF	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	

Tail Character	1	$	$

2.2.7.5. Picture Record Settings

The command **AT+GTPRS** is used to start the timing snapshots as per fixed interval.

➢ **AT+GTPRS=**

Example:
AT+GTPRS=cv200,3,60,1,2,2,2,0,,FFFF$

SN	Parameter	Length (Byte)	Range/Format	Default
1	Password	4 - 20	'0' – '9' 'a' – 'z' 'A' – 'Z'	cv200
2	Camera Source	1	0|1|2|3	0
3	Picture Interval	2	60-3600 (s)	60
4	Front Camera Picture Resolution	1	0~3	1
5	Front Camera Compression Quality	1	0|1|2	2
6	Interior Camera Picture Resolution	1	1~3	2
7	Interior Camera Compression Quality	1	0|1|2	2
8	Upload By FTP	1	0|1	0
9	Reserved	0		
	Serial Number	4	0000 – FFFF	
	Tail Character	1	$	$

✧ <*Camera Source*>: The definitions are as follow.

- 0: Disable
- 1: Front Camera
- 2: Interior Camera
- 3: Both

✧ <*Picture Interval*>: Interval between taking pictures (60~3600 s).

✧ <*Front Camera Picture Resolution*>: Compression picture resolution.

- 0: 1920*1080
- 1: 1280*720
- 2: 640*360
- 3: 320*180

✧ <*Interior Camera Picture Resolution*>: Compression picture resolution.

- 1: 1280*720
- 2: 640*360

- 3: 320*180

✧ <*Front Camera Compression Quality*> <*Interior Camera Compression Quality*>: Compression picture quality.

- 0: Low
- 1: Middle
- 2: High

✧ <*Upload By FTP*>: Whether to upload to FTP.

- 0: Disable
- 1: Enable

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

➢ **+ACK:GTPRS,**

Example: **+ACK:GTPRS,BD0200,868487004353181,cv200,0404,20210608141837,32B5$**			
Parameter	**Length (Byte)**	**Range/Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z', '0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Serial Number	4	0000 – FFFF	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

2.2.7.6. Picture Parameter Configuration

The command **AT+GTPPC** is applied to event snapshot compression.

➢ **AT+GTPPC=**

Example: **AT+GTPPC=cv200,1,0,0,1,0,,,,FFFF$**				
SN	**Parameter**	**Length (Byte)**	**Range/Format**	**Default**
1	Password	4 - 20	'0' – '9' 'a' – 'z' 'A' – 'Z'	cv200
2	Mode	1	0|1	0
3	Front Camera Picture Resolution	1	0~3	1
4	Front Camera Compression Quality	1	0|1|2	2

5	Interior Camera Picture Resolution	1	1~3	2
6	Interior Camera Compression Quality	1	0|1|2	2
7	Reserved	0		
8	Reserved	0		
9	Reserved	0		
	Serial Number	4	0000 – FFFF	
	Tail Character	1	$	$

✧ <*Mode*>: Is applied to event snapshot compression
- 0: Disable
- 1: Enable

✧ <*Front Camera Picture Resolution*>: Compression picture resolution
- 0: 1920*1080
- 1: 1280*720
- 2: 640*360
- 3: 320*180

✧ <*Interior Camera Picture Resolution*>: Compression picture resolution
- 1: 1280*720
- 2: 640*360
- 3: 320*180

✧ <*Front Camera Compression Quality*> <*Interior Camera Compression Quality*>: Compression picture quality
- 0: Low
- 1: Middle
- 2: High

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

➢ **+ACK:GTPPC,**

Example: **+ACK:GTPPC,BD0200,868487004353181,cv200,0404,20210608141837,32B5$**			
Parameter	**Length (Byte)**	**Range/Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z', '0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Serial Number	4	0000 – FFFF	

Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

2.2.8.Bluetooth Settings

2.2.8.1. Bluetooth Setting

The command **AT+GTBTS** is used to configure Bluetooth settings for the device to report certain events.

➢ **AT+GTBTS=**

Example: **AT+GTBTS=cv200,1,,,,,0902,0003,,,,,,,,,,,,FFFF$**				
SN	**Parameter**	**Length (Byte)**	**Range/Format**	**Default**
1	Password	4 – 20	'0' - '9', 'a' - 'z', 'A' - 'Z'	cv200
2	Mode	1	0|1	1
3	Reserved	0		
4	Reserved	0		
5	Reserved	0		
6	Reserved	0		
7	Reserved	0		
8	Bluetooth Report Mask	<=4	0000 – FFFF	0902
9	Bluetooth Event Mask	<=4	0000 – FFFF	0003
10	Reserved	0		
11	Reserved	0		
12	Reserved	0		
13	Reserved	0		
14	Reserved	0		
15	Reserved	0		
16	Reserved	0		
17	Reserved	0		
18	Reserved	0		
19	Reserved	0		

20	Reserved	0		
21	Reserved	0		
22	Reserved	0		
	Serial Number	4	0000 – FFFF	
	Tail Character	1	$	$

✧ <*Mode*>: The working mode of the Bluetooth.
- 0: Disable Bluetooth.
- 1: Enable Bluetooth.

✧ <*Bluetooth Report Mask*>: Bitwise mask to configure the composition of Bluetooth information in report messages.
- Bit 0 - Reserved
- Bit 1 for <*Bluetooth MAC Address*>
- Bit 2... Bit 7 - Reserved
- Bit 8 for <*Peer Role*>
- Bit 9 - Reserved
- Bit 10 - Reserved
- Bit 11 <*Peer MAC Address*>
- Bit 12 … Bit 15 - Reserved

For each bit, set it to 1 to enable the corresponding component in the report, and set it to 0 to disable the corresponding component in the report. This mask is valid for **+RESP:GTBCS**, **+RESP:GTBDS** report messages.

✧ <*Bluetooth Event Mask*>: Bitwise mask to configure which event report should be sent to the backend server.
- Bit 0 for **+RESP:GTBCS**
- Bit 1 for **+RESP:GTBDS**

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

➢ **+ACK:GTBTS,**

Example: **+ACK:GTBTS,BD0200,865084030960726,CV200,0029,20190411103140,02FF$**			
Parameter	**Length (Byte)**	**Range/Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z','0' – '9'}	
Unique ID	15	(IMEI)	
Device Name	<=20	'0' - '9', 'a' - 'z', 'A' - 'Z', '-', '_'	
Serial Number	4	0000 – FFFF	
Send Time	14	YYYYMMDDHHMMSS	

Count Number	4	0000 – FFFF	
Tail Character	1	$	$

2.2.8.2. Bluetooth Accessory Setting

The command **AT+GTBAS** is used for the device to scan or connect with Bluetooth accessories in order to obtain data such as humidity, temperature. To use this command, the parameter <*Mode*> in the command **AT+GTBTS** must be enabled.

➢ **AT+GTBAS=**

Example: **AT+GTBAS=cv200,0,6,4,WMS301,FFFFFFFFFFFF,7FFF,30,2400,,0,0,10,2,300,0,20,30,2,300,,0,0,0,0,,,FFFF$**				
SN	**Parameter**	**Length (Byte)**	**Range/Format**	**Default**
1	Password	4 – 20	'0' - '9', 'a' - 'z', 'A' - 'Z'	cv200
2	Index	1	0 – 9	0
3	Accessory Type	<=2	0|6|13	0
4	Accessory Model	1	0|4	0
5	Accessory Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
6	Accessory MAC	12	000000000000 – FFFFFFFFFFFF	FFFFFFFFFFFF
7	Accessory Append Mask	<=4	0 – FFFF	FFFF
8	Read Interval	<=5	10 – 86400(Sec)	30
9	Low Voltage Threshold	<=4	0 – 5000(mV)	2400
10	Reserved			
11	Accessory Parameters (Optional)			
12	Reserved			
13	Output ID	1	0 – 1	0
14	Output Status	1	0 – 1	0
15	Duration	<=3	0 – 255(×100ms)	0
16	Toggle Times	<=3	0 – 255	0
17	Reserved			
18	Reserved			

	Serial Number	4	0000 – FFFF	
	Tail Character	1	$	$

✧ <*Index*>: The index of the Bluetooth accessory. The device supports a maximum of 2 connectable Bluetooth accessories and up to 10 Bluetooth beacon accessories.

✧ <*Accessory Type*>: The type of the Bluetooth accessory which is defined in the <*Index*>. The following is supported now:

- 0: No Bluetooth accessory.
- 6: Multi-functional beacon sensor.

Temperature Mode	1	0 – 3	0
Low Temperature	<=3	-40 – 80℃	0
High Temperature	<=3	-40 – 80℃	10
Temperature Validity	<=2	1 – 10 sec	2
Temperature Send Interval	<=5	30 – 43200 sec	300
Humidity Mode	1	0 – 3	0
Low Humidity	<=3	0 – 100rh	20
High Humidity	<=3	0 – 100rh	30
Humidity Validity	<=2	1 – 10 sec	2
Humidity Send Interval	<=5	30 – 43200 sec	300

The device will report the **+RESP:GTBAA** message to the backend server when the temperature and humidity meet alarm conditions.

✧ <*Temperature Mode*>: The working mode of the temperature alarm.

- 0: Disable temperature alarm.
- 1: Report temperature alarm if the current temperature is within the temperature range defined by <*Low Temperature*> and <*High Temperature*>.
- 2: Report temperature alarm if the current temperature is outside the temperature range defined by <*Low Temperature*> and <*High Temperature*>.
- 3: Report temperature alarm only once if the current temperature enters or exits the temperature range defined by <*Low Temperature*> and <*High Temperature*>. In this mode, <*Temperature Send Interval*> will be ignored.

✧ <*Low Temperature*>: It specifies the lower temperature limit.

✧ <*High Temperature*>: It specifies the upper temperature limit.

✧ <*Temperature Validity*>: If the sensor detects the environment temperature which meets the alarm condition, it will continuously check the temperature. If the temperature keeps meeting the alarm condition for <*Temperature Validity*> times, the temperature alarm will be triggered.

✧ <*Humidity Mode*>: The working mode of the humidity alarm.

- 0: Disable humidity alarm.
- 1: Report humidity alarm if the current humidity is within the humidity range

defined by <*Low Humidity*> and <*High Humidity*>.

- 2: Report humidity alarm if the current humidity is outside the humidity range defined by <*Low Humidity*> and <*High Humidity*>.
- 3: Report humidity alarm only once if the current humidity enters or exits the humidity range defined by <*Low Humidity*> and <*High Humidity*>. In this mode, <*Humidity Send Interval*> will be ignored.

✧ <*Low Humidity*>: It specifies the lower humidity limit.

✧ <*High Humidity*>: It specifies the upper humidity limit.

✧ <*Humidity Validity*>: If the sensor detects the humidity in surrounding environment meets the alarm condition, it will continuously check the humidity. If the humidity keeps reaching to the alarm condition for <*Humidity Validity*> times, the humidity alarm will be triggered.

- 13: Relay Bluetooth accessory. Five reserved parameters are used as follows:

Relay Event Notification	1	0 – 1	0
Password	<=6	'0' – '9' 'a' – 'z' 'A' – 'Z'	123456
New Password	<=6	'0' – '9' 'a' – 'z' 'A' – 'Z'	123456
Reserved			
Reserved			

✧ <*Relay Event Notification*>: It configures whether to enable event notification function.

- 0: Disable relay event notification.
- 1: Enable relay event notification. If a new event occurs on the accessory, the device will report the **+RESP:GTBAA** message.

✧ <*Password*>: It is the current password for the accessory device.

✧ <*New Password*>: It is set to change the current password.

Note: <*New Password*> is set successfully, <*Password*> will be changed to <*New Password*>.

✧ <*Accessory Model*>: The model of the Bluetooth accessory which is defined in <*Accessory Type*>. The following is supported now:

- The model of multi-functional beacon sensor (<*Accessory Type*> is 6):
  4: WMS301 (Door Sensor with embedded Temperature and Humidity Sensor)
  Note: The WMS301 accessories do not support connection by name.
- The model of Relay Sensor (<*Accessory Type*> is 13):
  0: WRL300 sensor
  Note: The WRL300 accessories do not support connection by name.

✧ <*Accessory Name*>: The name of the Bluetooth accessory.

✧ <*Accessory MAC*>: The MAC address of the Bluetooth accessory.

Note: If <*Accessory MAC*> of the Bluetooth accessory is valid and the MAC address of the Bluetooth accessory is unique, the device will use the MAC address to scan or connect Bluetooth accessories.

✧ <*Accessory Append Mask*>: If the device is connected with the Bluetooth accessory, and Bit 8 (for <*Bluetooth Accessory Data*>) of <*ERI Mask*> is set to 1, the device will report Bluetooth accessory data via **+RESP:GTERI** instead of **+RESP:GTFRI**. This mask is used to configure the

accessory data fields to be reported in the **+RESP:GTERI** and **+RESP:GTBAA** messages. To obtain the <*Accessory Append Mask*> supported by the accessory, refer to the Appendix C.

Note: If Bit14 is set to 1, the device will report <*Relay state*>, but not report <*Relay Config Result*> in the **+RESP:GTERI** messages.

Mask Bit	Item	Description
Bit 0	<*Accessory Name*>	Accessory Name
Bit 1	<*Accessory MAC*>	Accessory MAC
Bit 2	<*Accessory Status*>	Accessory Bluetooth Status
Bit 3	<*Accessory Battery Level*>	Accessory Battery Level
Bit 4	<*Accessory Temperature*>	Accessory Temperature
Bit 5	<*Accessory Humidity*>	Accessory Humidity
Bit 6	Reserved	Reserved
Bit 7	Reserved	N/A
Bit 8	Reserved	N/A
Bit 9	Reserved	N/A
Bit 10	Reserved	N/A
Bit 11	Reserved	N/A
Bit 12	Reserved	N/A
Bit 13	<*Accessory Battery Percentage*>	Accessory Battery Percentage
Bit 14	<*Relay Data*>	Including <*Relay Config Result*>, <*Relay state*>
Bit 15	Reserved	N/A

- <*Read Interval*>: The interval for reading data from the Bluetooth accessory. This parameter is only valid when the Bluetooth accessory is a Bluetooth connectable accessory.
- <*Low Voltage Threshold*>: It specifies the lower voltage limit. When the voltage of Bluetooth accessory is below this value, the device will report message **+RESP:GTBAA** to the backend server. 0 means “Disable low voltage detection”.
- <*Output ID*>: The ID of the output port to output the specified wave shape when the **+RESP:GTBAA** event is detected. If it is set to 0, there is no output waveform.

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

- **+ACK:GTBAS,**

Example: **+ACK:GTBAS,BD0200,868487004353181,CV200,0,0005,20090214093254,11F0$**			
Parameter	**Length (Byte)**	**Range/Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z','0' – '9'}	
Unique ID	15	(IMEI)	
Device Name	<=20	'0' - '9', 'a' - 'z', 'A' - 'Z', '-', '_'	
Index	1	0 – 9	0
Serial Number	4	0000 – FFFF	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

2.2.8.3. Bluetooth Beacon ID Setting

The command **AT+GTBID** is used for the device to scan Bluetooth beacon accessories. To use this function, the parameter <*Mode*> in the command **AT+GTBTS** must be 1.

- **AT+GTBID=**

Example: **AT+GTBID=cv200,0,0,0,A,2400,0,1,1,,0,0,30,0,5,,0,0,0,0,,,FFFF$**				
SN	**Parameter**	**Length (Byte)**	**Range/Format**	**Default**
1	Password	4 – 20	'0' - '9', 'a' - 'z', 'A' - 'Z'	cv200
2	Index	1	0 – 2	0
3	Enable	1	0|1	0
4	Beacon ID Model	1	0	0
5	Accessory Append Mask	<=4	0000 – FFFF	000A
6	Low Voltage Threshold	<=4	0 – 5000(mV)	2400
7	Reserved	0		
8	Start Index	<=3	1 – 300	
9	End Index	<=3	1 – 300	
10	MAC List	<=12*75		
11	Reserved (Optional)	0		

12	Reserved (Optional)	0		
13	Reserved (Optional)	0		
14	Reserved (Optional)	0		
15	Reserved (Optional)	0		
16	Reserved	0		
17	Output ID	1	0 – 1	0
18	Output Status	1	0 – 1	0
19	Duration	<=3	0 – 255(×100ms)	0
20	Toggle Times	<=3	0 – 255	0
21	Reserved	0		
22	Reserved	0		
	Serial Number	4	0000 – FFFF	
	Tail Character	1	$	$

✧ <*Index*>: The index of the beacon Bluetooth accessory.

✧ <*Enable*>: Enable/disable this function.

- 0: Disable this function.
- 1: Enable this function.

✧ <*Beacon ID Model*>: The model of the Bluetooth accessory. The following is supported now:

- 0: WKF300. Five reserved parameters are used as follows:

Push Button Event	1	0|1	0
Keyfob Detection Mode	1	0 – 2	0
Keyfob Detection Interval	<=3	30 – 600(Sec)	30
Reserved	0		
Reserved	0		

✧ <*Push Button Event*>: If this parameter is set to 1 and the button on WKF300 is pushed, the device will report the message **+RESP:GTBAA** to backend server.

✧ <*Keyfob Detection Mode*>: It specifies the mode of detecting Keyfob.

- 0: Disable Keyfob detection.
- 1: Enable Keyfob detection: Allow the device to scan only once. After entering ignition on and moving state, the device will scan Keyfobs one time for the time period specified by <*Keyfob Detection Interval*> and then will send the **+RESP:GTBID** message to report information of Keyfob(s). If more than 3 Keyfobs are detected, the **+RESP:GTBID** message contains information of top 3 Keyfobs with the strongest signal.
- 2: Enable Keyfob detection: Allow the device to scan continuously. After

entering ignition on and moving state, the device will keep scanning Keyfobs continuously. If the device detects Keyfob(s) or change of available Keyfob(s), it will send the **+RESP:GTBID** message to report information of Keyfob(s). If more than 3 Keyfobs are detected, the **+RESP:GTBID** message contains information of top 3 Keyfobs with the strongest signal.

- ✧ <*Keyfob Detection Interval*>: The device scans Keyfobs for the time period specified by this parameter when <*Keyfob Detection Mode*> is 1.

✧ <*Accessory Append Mask*>: Bitwise mask to configure the composition of the Bluetooth accessory information in **+RESP:GTBAA** and **+RESP:GTBID** messages.

- Bit 0: Reserved
- Bit 1: <*Accessory MAC*>
- Bit 2: Reserved
- Bit 3: <*Accessory Battery Level*>.
- Bit 4: Reserved
- Bit 5: Reserved
- Bit 6: <*Accessory Signal Strength*>, only valid for **+RESP:GTBID**.

✧ <*Low Voltage Threshold*>: It specifies the lower voltage limit. When the voltage of Bluetooth accessory is below this value, the device will report message **+RESP:GTBAA** to the backend server. 0 means "Disable low voltage detection".

✧ <*Start Index*>, <*End Index*>: The index range of the MAC list to which the MAC addresses are to be updated. For example, if <*Start Index*> is set to 1 and <*End Index*> is set to 2, then the first two MAC addresses in the MAC list will be updated by the MAC addresses provided in the parameter <*MAC List*>. <*Start Index*> and <*End Index*> determine the total number of MAC addresses that will be updated. If either one is empty, there should be no <*MAC List*> following the empty value. A maximum of 75 MAC addresses can be updated each time.

✧ <*MAC List*>: A list of comma-separated MAC addresses to be updated to the MAC list. The number of the MAC addresses is determined by <*Start Index*> and <*End Index*>.

Note: If more accessories are needed, please adjust <*Start Index*> and <*End Index*> for appropriate setup. If some MAC addresses in <*MAC List*> are empty, then the corresponding MAC addresses will be deleted. For example, to delete the 4th, 5th and 6th MAC addresses of the <*MAC List*>, please set <*Start Index*> to 4 and set <*End Index*> to 6 and keep those three MAC addresses of <*MAC List*> empty. The maximum number of MAC addresses for all indexes is 300.

✧ <*Output ID*>: The ID of the output port to output the specified wave shape when the **+RESP:GTBAA** event is detected. If it is set to 0, there is no output waveform.

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

➢ **+ACK:GTBID,**

Example: **+ACK:GTBID,BD0200,868487004353181,CV200,0,0005,20090214093254,11F0$**			
Parameter	**Length (Byte)**	**Range/Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' –	

		'Z','0' – '9'}	
Unique ID	15	(IMEI)	
Device Name	<=20	'0' - '9', 'a' - 'z', 'A' - 'Z', '-', '_'	
Index	1	0 – 2	0
Serial Number	4	0000 – FFFF	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

2.2.9.Other Settings

2.2.9.1. Real Time Operation

The command **AT+GTRTO** is used to retrieve information from the terminal or control the terminal to execute certain actions.

➢ **AT+GTRTO=**

Example: **AT+GTRTO=cv200,2,3FFFFFFFFFFFFFFF,,,,,,,FFFF$**				
SN	**Parameter**	**Length (Byte)**	**Range/Format**	**Default**
1	Password	4 – 20	'0' – '9' 'a' – 'z' 'A' – 'Z'	cv200
2	Sub Command	<=2	0 – FF	
3	AT Command/ Configuration Mask/ ATI Mask/SCS Action/ Time Range/Module Type/RLY Operation Mode	3|16-32|8|1|1|1|0-1	"SRI"|00000000000000000000000000000000 – FFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFF|00000000 – FFFFFFFF|0-2|0	
4	Reserved	0		
5	Reserved			
6	Reserved			
7	Sub Command Parameter	<=100		
8	Reserved	0		
9	Reserved	0		
	Serial Number	4	0000 – FFFF	

	Tail Character	1	$	$

✧ <*Sub Command*>: A hex value to indicate the sub command to be executed.

- 0: ***GPS***. Get the GNSS related information via the message **+RESP:GTGPS**.
- 1: ***RTL***. Request the terminal to report its current position immediately via the message **+RESP:GTRTL**.
- 2: ***READ***. Get the current configuration of the terminal via the message **+RESP:GTALS/+RESP:GTALC/+RESP:GTALM**.
- 3: ***REBOOT***. Reboot the terminal.
- 4: ***RESET***. Reset all parameters except those configured by **AT+GTBSI**, **AT+GTSRI**, **AT+GTCFG**, **AT+GTTMA** and **AT+GTPIN** to factory settings and clear all buffered messages.
- 5: ***PWROFF***. Power off the device. The command is only valid while all external powers disconnect.
- 6: ***CID***. Get the ICCID of the SIM card which is being used by the terminal via the message **+RESP:GTCID**.
- 7: ***CSQ***. Get the current network signal level of the terminal via the message **+RESP:GTCSQ**.
- 8: ***VER***. Get the version information of the device via the message **+RESP:GTVER**.
- 9: ***BAT***. Get the battery percentage and charging status of the terminal via the message **+RESP:GTBAT**.
- A: ***Reserved***.
- B: ***TMZ***. Get the time zone settings via the message **+RESP:GTTMZ**.
- C: ***GIR***. Get cell information via the message **+RESP:GTGSM**.
- D: ***AIF***: Get APN, ICCID, base station ID, RSSI, Cell ID, and IP via **+RESP:GTAIF.**
- E: ***GSV***: Request the device to report the GPS fix level. The corresponding information will be reported via the message **+RESP:GTGSV.**
- 14: ***DELBUF***: Delete all the buffered reports.
- ***15: Format TF Card:*** Format the TF card. *<TF Card State>* of **+RESP:GTOSI** will be changed.
- 20: DSS. Request to activate the DSS feature. The terminal will connect to the hosted server to activate the specific DSS feature. The result of the operation will be reported via the **+RESP:GTDAR**.
- 21: DAR. Reporting the states of DSS activation via the message +RESP:GTDAR.
- 25: ***SCS***. Get the self-calibration status of the acceleration data via the message **+RESP:GTSCS** or clear the self-calibration status. It is used together with <*SCS Action*> below.
- 38: ***VDO***. Send the specified time period video to the FTP server.
- 39: ***PSL.*** Send the specified time period log to the FTP server. (**Note:** All the "crash logs" will be pulled out from the memory card and sent if it exists.)
- 3A: ***SOD***. Push video stream to the RTMP server.
- 3B: ***PIC.*** Used to request the picture files from the local storage of the camera while camera is online.
- 3C: ***RFQ.*** Used to query the stored files from the camera remotely while the camera

is online.

- 40: RLY. Set the state of the WRL300.

✧ *<AT Command/Configuration Mask/ATI Mask/SCS Action/Time Range/Module Type>*:

- AT Command: To get single AT command configuration when <*Sub Command*> is set to 2, please follow the format in the following example. Example: To get the configuration of **AT+GTFRI**, please set AT+GTRTO=cv200,2,FRI,,,,,0015$, and get it via **+RESP:GTALS**.

  Note: To get local time information, please use "TMZ".

- Configuration Mask: If <*Sub Command*> is set to 2, configuration information which varies depending on the selected configuration mask can be obtained via the message **+RESP:GTALC**. The configuration mask must be 16 bytes. If it is less than 16 bytes, add '0' in the high bytes of the configuration mask.

Configuration Mask Table:

Mask Bit	Item
Bit 61	PRS
Bit 60	Reserved
Bit 59	SSA
Bit 58	OSD
Bit 57	ODP
Bit 56	OSP
Bit 55	VOL
Bit 54	OPB
Bit 53	OUT
Bit 52	WFS
Bit 51	VMS
Bit 50	FSO
Bit 49	REC
Bit 48	PPC
Bit 47	Reserved
Bit 46 ~ Bit 43	Reserved
Bit 42	PEO
Bit 41	Reserved
Bit 40	Reserved
Bit 39	URT

Bit 38	Reserved
Bit 37	Reserved
Bit 36	BID
Bit 35	BAS
Bit 34	BTS
Bit 33	Reserved
Bit 32	UPC
Bit 31	ASC
Bit 30	DSS
Bit 29	Reserved
Bit 28	Reserved
Bit 27	Reserved
Bit 26	Reserved
Bit 25	SSR
Bit 24	Reserved
Bit 23	Reserved
Bit 22	Reserved
Bit 21	PDS
Bit 20	CRA
Bit 19	WLT
Bit 18	Reserved
Bit 17	HBM
Bit 16	HMC
Bit 15	IDL
Bit 14	DOG
Bit 13	Reserved
Bit 12	PIN
Bit 11	SOS
Bit 10	GEO
Bit 9	FRI

Bit 8	TMA
Bit 7	Reserved
Bit 6	DIS
Bit 5	Reserved
Bit 4	Reserved
Bit 3	CFG
Bit 2	Reserved
Bit 1	SRI
Bit 0	BSI

- SCS Action: It specifies whether to read or clear self-calibration status when <*Sub Command*> is set to 25.
  0: Read self-calibration status.
  1: Clear self-calibration status.
- Time Range: Specified time period log when <Sub Command> is set to 39
  0: Today
  1: Today + Yesterday
  2: All
- Module Type: Specified module type when <Sub Command> is set to 20
  0: DMS
- RLY Operation Mode: Specify relay operation mode when <Sub Command> is set to 40.
  0: Disable relay of WRL300, switch the pin of relay from NC to COM.
  1: Enable relay of WRL300, switch the pin of relay from NO to COM.

✧ <*Sub Command Parameter*>: This parameter is used for part of the sub commands. This field cannot be empty for the sub-commands listed below.

For the sub command RESET (4):

- 0: Light. Reset all configuration parameters, except:
  (1) Reserved.
  (2) Network related configuration (AT+GTBSI, AT+GTSRI, AT+GTPIN).
  (3) Device password (AT+GTCFG).
  (4) Time Zone (AT+GTTMA).
- 1: Heavy. Reset all configuration parameters except AT+GTPIN.

For the sub command DSS (20):

- User Key

For the sub command RLY (40):

- Bind BAS Index: It is used to bind the specific configuration in AT+GTBAS when the <Sub Command> is set to 3A. The value is the same as the index in AT+GTBAS.

RTO-VDO: The feature is used to request the video files from the camera's local storage. When <Sub Command> is set to 38, the parameters are as follow:

Example: **AT+GTRTO=cv200,38,0,20211012_151540_00_2,,,,,,FFFF$**				
SN	**Parameter**	**Length (Byte)**	**Range/Format**	**Default**
1	Password	4 – 20	'0' – '9' 'a' – 'z' 'A' – 'Z'	cv200
2	Sub Command	<=2	0 – FF	38
3	Query Type	1	0|1	0
4	Video Source	<=35		
5	Video Time	14	YYYYMMDDHHMMSS	
6	Pre-Event	<=2	0~60(s)	5
7	Post-Event	<=2	0~60(s)	5
8	Reserved	0		
9	Reserved	0		
	Serial Number	4	0000 – FFFF	
	Tail Character	1	$	$

- <*Query Type*>: The type of VDO query.
  - 0: File name query.
  - 1: Time range query.
- <*Video Source*>: If <*Query Type*> = 0, <*Video Source*> is a file name (e.g: 20211008_110000_F0_1). If <*Query Type*> = 1, the definitions are as follow:
  - 0: Front Camera
  - 1: Interior Camera
  - 2: Both
- <*Video Time*>: If <*Query Type*> = 1, it specifies the time to search a video.
- <*Pre-Event*>: If <*Query Type*> = 1, it specifies the pre-duration of the video.
- <*Post-Event*>: If <*Query Type*> = 1, it specifies the post-duration of the video. **Note:** Pre-Event + Post-Event = Duration, Duration > 1 and Duration <= 60.

RTO-SOD: The feature is used to request the live streaming and playback streaming while camera is online. When <Sub Command> is set to 3A, the parameters are as follow:

Example: **AT+GTRTO=cv200,3A,0,218.17.46.11:1935/live,video_ch,0,0,,,FFFF$**				
SN	**Parameter**	**Length (Byte)**	**Range/Format**	**Default**
1	Password	4 – 20	'0' – '9' 'a' – 'z' 'A' – 'Z'	cv200
2	Sub Command	<=2	0 – FF	3A
3	Pushing Mode	1	0|1	0
4	RTMP Server	0< X <=100		Ip:port/app_na

				me
5	Encoder Key	0< X <=100		
6	Streaming Type	1	0	0
7	Video Source	<=35		
8	Video Time	14	YYYYMMDDHHMMSS	
9	Pre-Event	<=2	0 ~ 60 (s)	5
10	Post-Event	<=2	0 ~ 60 (s)	5
11	Start Time	14	YYYYMMDDHHMMSS	
12	End Time	14	YYYYMMDDHHMMSS	
	Serial Number	4	0000 – FFFF	
	Tail Character	1	$	$

- <*Pushing Mode*>: configure to start/stop push RTMP stream.
  - 0: Stop pushing.
  - 1: Start pushing.
- <*RTMP Server*>: The RTMP server URL, Ip:port/app_name
- <*Encoder Key*>: Specifies the stream ID of the RTMP server.
- <*Streaming Type*>: The type of push RTMP stream.
  - 0: Real-time.
  - 1: Video File.
  - 2: Video Time Range
  - 3: Video Review
- <*Video Source*>: If <*Streaming Type*> = 1, <*Video Source*> is a file name (e.g: 20211008_110000_00_1). If <*Streaming Type*> = 0 or 2 or 3, the definitions are as follow:
  - 0: Front Camera
  - 1: Interior Camera
- <*Video Time*>: If <*Streaming Type*> = 2, it specifies the time to search a video and push to RTMP stream.
- <*Pre-Event*>: If <*Streaming Type*> = 2, it specifies the pre-duration of the video.
- <*Post-Event*>: If <*Streaming Type*> = 2, it specifies the post-duration of the video. **Note:** Pre-Event + Post-Event = Duration, Duration > 1 and Duration <= 60
- <*Start Time*><*End Time*>: If <*Streaming Type*> = 3, it specifies the start/end-time of the requested streaming. **Note:** End Time should be later than Start Time.

RTO-PIC: The feature is used to request the snapshots as setting parameters while camera is online. When <Sub Command> is set to 3B, the parameters are as follow:

Example:
AT+GTRTO=cv200,3B,0,20211206_190334_00_1,,,,,,,,,,FFFF$

SN	Parameter	Length (Byte)	Range/Format	Default
1	Password	4 – 20	'0' – '9' 'a' – 'z' 'A' – 'Z'	cv200
2	Sub Command	<=2	0 – FF	3B
3	Query Type	1	0	0
4	Picture Source	<=35		
5	Reserved	0		
6	Reserved	0		
7	Reserved	0		
8	Reserved	0		
9	Reserved	0		
10	Reserved	0		
11	Reserved	0		
12	Reserved	0		
13	Reserved	0		
14	Reserved	0		
	Serial Number	4	0000 – FFFF	
	Tail Character	1	$	$

✧ <*Query Type*>: The type of PIC query.

- 0: File name query.
  Query the saved picture from memory card and upload it to the server

✧ <*Picture Source*>: If <*Query Type*> = 0, <*Picture Source*> is a file name (e.g: 20211008_110000_F0_1).

RTO-RFQ: The feature is used to query the stored files from the camera remotely while camera is online. When <Sub Command> is set to 3C, the parameters are as follow:

Example: **AT+GTRTO=cv200,3C,2,1,00,20211206061515,20211207151515,,,FFFF$**				
SN	**Parameter**	**Length (Byte)**	**Range/Format**	**Default**
1	Password	4 – 20	'0' – '9' 'a' – 'z' 'A' – 'Z'	cv200
2	Sub Command	<=2	0 – FF	3C
3	Camera Source	1	0|1|2	
4	File Type	1	0|1	

5	Event type	0|2	empty | 00~FF	
6	Start Time	14	YYYYMMDDHHMMSS	
7	End Time	14	YYYYMMDDHHMMSS	
8	Reserved	0		
9	Reserved	0		
	Serial Number	4	0000 – FFFF	
	Tail Character	1	$	$

✧ <*Camera Source*>: the definitions are as follow:

- 0: Front Camera
- 1: Interior Camera
- 2: Both

✧ <*File Type*>:

- 0: Picture
- 1: Video

✧ <*Event Type*>: Without any value, it will query all types of files, otherwise the type is as same as <Event Code> in **Appendix B: Event Code – Recording Type**

✧ <*Start Time*>: Start time of query.

✧ <*End Time*>: End time of query. (End Time - Start Time < 10 days)

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

➢ **+ACK:GTRTO,**

Example: **+ACK:GTRTO,BD0202,868487004358800,cv200,3A,FFFF,20211020164513,BA5F$**			
Parameter	**Length (Byte)**	**Range/Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z','0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Sub Command	<=2	0 – FF	
Serial Number	4	0000 – FFFF	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

✧ <*Sub Command*>: A string to indicate the sub command of **AT+GTRTO**.

2.2.9.2. Hour Meter Count

The command **AT+GTHMC** is used to measure the accumulated time of use with each actuation of the ignition on. When the device sends the **+RESP:GTFRI**, **+RESP:GTIGN** or **+RESP:GTIGF** message, <*Hour Meter Count*> will be included in the report.

➢ **AT+GTHMC=**

Example: **AT+GTHMC=cv200,0,00000:00:00,,,,,,,,FFFF$**				
SN	**Parameter**	**Length (Byte)**	**Range/Format**	**Default**
1	Password	4 – 20	'0' – '9' 'a' – 'z' 'A' – 'Z'	cv200
2	Hour Meter Enable	1	0|1	0
3	Initial Hour Meter Count	11	00000:00:00 – 99999:00:00	00000:00:00
4	Reserved	0		
5	Reserved	0		
6	Reserved	0		
7	Reserved	0		
8	Reserved	0		
9	Reserved	0		
10	Reserved	0		
11	Reserved	0		
	Serial Number	4	0000 – FFFF	
	Tail Character	1	$	$

✧ <*Hour Meter Enable*>: Enable/disable the hour meter count function. If the hour meter count function is enabled, the hour meter count will be increased when the device detects the vehicle ignition is on.

- 0: Disable the hour meter count function.
- 1: Enable the hour meter count function.

✧ <*Initial Hour Meter Count*>: It is formatted with 5 hour digits, 2 minute digits and 2 second digits, and ranges from 00000:00:00 – 99999:00:00. The <*Hour Meter Count*> which is reported in **+RESP:GTFRI**, **+RESP:GTIGN** or **+RESP:GTIGF** will be increased based on the value when the ignition is turned on for the first time.

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

➢ **+ACK:GTHMC,**

Example:

+ACK:GTHMC,BD0200,868487004353181,cv200,0407,20210608143440,32C7$			
Parameter	**Length (Byte)**	**Range/Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z','0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Serial Number	4	0000 – FFFF	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

2.2.9.3. White List

The command **AT+GTWLT** is used to configure a list of authorized phone numbers which are allowed to perform the location by call, voice answering and SMS functions.

➢ **AT+GTWLT=**

Example: **AT+GTWLT=cv200,5,1,1,,,,,,FFFF$**				
SN	**Parameter**	**Length (Byte)**	**Range/Format**	**Default**
1	Password	4 – 20	'0' – '9' 'a' – 'z' 'A' – 'Z'	cv200
2	Call Filter	1	0 – 7	0
3	Phone Number Start	<=2	1-10	1
4	Phone Number End	<=2	1-10	1
5	White Number List	<=20*10		
6	Reserved	0		
7	Reserved	0		
8	Reserved	0		
9	Reserved	0		
	Serial Number	4	0000 – FFFF	
	Tail Character	1	$	$

✧ <*Call Filter*>: The working mode of this function.

- Bit 0: White list for location by call.
- Bit 1: White list for voice answering.

- Bit 2: White list for SMS. Gateway number and SOS number will ignore the white list function.

For each bit, set it to 1 to enable the corresponding function, and 0 to disable it. If the values of Bit 0, Bit 1 and Bit 2 are all 0, it means "Disable this function and allow any phone number to use the location by call, voice answering function and SMS functions".

Note: If both Bit 1 and Bit 0 are set to 1, the device will only answer incoming calls from the predefined phone numbers.

✧ <*Start Index*>, <*End Index*>: The index range of the white list to which the phone numbers are to be updated. For example, if the <*Start Index*> is set to 1 and the <*End Index*> is set to 2, then the first two phone numbers in the white list will be updated by the numbers provided in the parameter <*Phone Number List*>. The <*Start Index*> and <*End Index*> define the total number of phone numbers that will be updated. If either one is empty, there should be no <*Phone Number List*>.

✧ <*Phone Number List*>: A list of comma-separated phone numbers to be updated to the white list. The number of the phone numbers are defined by <*Start Index*> and <*End Index*>.

Note: If more phone numbers are needed, please adjust <*Start Index*> and <*End Index*> for appropriate setup. If some operators in <*Phone Number List*> are empty, then the corresponding phone numbers will be deleted. For example, to delete the 4th, 5th and 6th phone numbers of the <*Phone Number List*>, please set <*Start Index*> to 4 and set <*End Index*> to 6 and keep those three phone numbers of <*Phone Number List*> empty.

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

➢ **+ACK:GTWLT,**

Example: **+ACK:GTWLT,BD0200,868487004353181,cv200,0408,20210608143626,32CA$**			
Parameter	**Length (Byte)**	**Range/Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z','0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Serial Number	4	0000 – FFFF	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

Note: Make sure the total size of the command is not greater than 160 bytes if the command is sent via SMS.

2.2.9.4. Update Configuration Over the Air

The **AT+GTUPC** command is used to download configuration file over the air for the update of the local configuration.

➢ **AT+GTUPC=**

Example: **AT+GTUPC=cv200,0,10,0,0,0,,0,,0,0,,3,FFFF$**				
SN	**Parameter**	**Length (Byte)**	**Range/Format**	**Default**
1	Password	4 – 20	'0'-'9','a'-'z','A'-'Z'	cv200
2	Max Download Retries	1	0 – 3	0
3	Download Timeout	<=2	5 – 30 min	10
4	Download Protocol	1	0|2	0
5	Report Enable	1	0|1	0
6	Update Interval	<=4	0 – 8760 hour	0
7	Download URL	<=100	URL	
8	Mode	1	0|1	0
9	Reserved	0		
10	Extended Status Report	1	0|1	0
11	Identifier Number	<=8	(HEX)	00000000
12	Reserved	0		
13	Update Status Mask	1	(HEX)	3
	Serial Number	4	0000 – FFFF	
	Tail Character	1	$	$

✧ <*Password*>: The valid characters of password include '0'-9', 'a'-'z', 'A'-'Z'. The default value is "cv200".

✧ <*Max Download Retries*>: Specifies the maximum time of retrying to download the configuration file upon downloading failure.

✧ <*Download Timeout*>: If downloading is not finished within this time, it will be regarded that the downloading failed.

✧ <*Download Protocol*>: The protocol used to download the file.

- 0: HTTP
- 2: FTP

✧ <*Report Enable*>: It defines whether to report the message **+RESP:GTUPC** or **+RESP:GTEUC** when the configuration is updated over the air.

- 0: Do not report the message **+RESP:GTUPC** or **+RESP:GTEUC**.

- 1: Report the message **+RESP:GTUPC** or **+RESP:GTEUC**.

✧ <*Update Interval*>: The time interval (hour) for updating the configuration over the air.

✧ <*Download URL*>: Specifies the URL to download the configuration file. If the URL ends with "/", it means this is a path without any file name. <imei>. ini will be added as the file name at the end of URL.

✧ <*Mode*>: A numeric to indicate the working mode of downloading configuration over the air

- 0: Disable this function.
- 1: Enable this function

✧ <*Extended Status Report*>: A numeral to indicate the message to be reported for the configuration update status when <*Enable Report*> is 1.

- 0: Report the message **+RESP:GTUPC**.
- 1: Report the message **+RESP:GTEUC** to include more information.

✧ <*Identifier Number*>: A numeral to identify the configuration update request. This number will be included in the message **+RESP:GTEUC** to indicate the request it is related to.

✧ <*Update Status Mask*>: The bitwise mask to configure the status in which the device can update the configuration.

- Bit 0 for ignition off
- Bit 1 for ignition on

Note:

1. The maximum number of commands in configuration file is 255. If there are more than 255 commands in the configuration file, the device will fail to download the configuration file.
2. Make sure there is only one command per line in the configuration file and there is a "\r\n" between two commands.
3. There should be no space before each command.
4. The configuration file should be a plain text file.
5. **+RESP:GTEUC** in hex format has the same message format as **+RESP:GTUPC**.

The acknowledgement message of **AT+GTUPC** command is reported as location report.

Notice:

If the <*download URL*> ends with "/", it means the URL is a path without file name. <imei>. ini will be added as the file name at the end of URL. If it is larger than 100, an error will be reported.

The acknowledgement message of the **AT+GTUPC** command:

➢ **+ACK:GTUPC,**

Example: **+ACK:GTUPC,BD0200,868487004353181,cv200,0409,20210608143705,32CB$**			
Parameter	**Length (Byte)**	**Range/Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z','0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	

Serial number	4	0000 – FFFF	
Send time	14	YYYYMMDDHHMMSS	
Count number	4	0000 – FFFF	
Tail character	1	$	$

2.2.9.5. Configuration File Version

The command **AT+GTFVR** is used to record information of the configuration file generated by the Manager Tool for **AT+GTUPC**.

➢ **AT+GTFVR=**

Example:
AT+GTFVR=cv200,,0000,,,,,,,,,20210604094350,FFFF$

SN	Parameter	Length (Byte)	Range/Format	Default
1	Password	4 – 20	'0' – '9''a' – 'z' 'A' – 'Z'	cv200
2	Configuration Name	<=40	'0' – '9', 'a' – 'z', 'A' – 'Z', '-', '_'	
3	Configuration Version	4	0000 – 9999	
4	Reserved	0		
5	Reserved	0		
6	Reserved	0		
7	Reserved	0		
8	Digital Signature	32	'0' –'9' 'a' – 'z' 'A' – 'Z'	
9	Reserved	0		
10	Reserved	0		
11	Reserved	0		
12	Reserved	0		
13	Generation Time	14	YYYYMMDDHHMMSS	
	Serial Number	4	0000 – FFFF	
	Tail Character	1	$	$

✧ <*Password*>: The valid characters for the password include '0'-'9', 'a' – 'z', and 'A'-'Z'. This password is defined in @Track protocol document.

✧ <*Configuration Name*>: The name of the configuration file.

✧ <*Configuration Version*>: The version number of the configuration file. The first two characters indicate the major version number, and the last two characters indicate the minor version number.

✧ <*Digital Signature*>*:* The parameter is used to confirm the validity of subsequent commands.

✧ <*Generation Time*>: The time when the configuration file is generated.

Note: The **AT+GTFVR** command must be the first command in the configuration file.

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

➢ **+ACK:GTFVR,**

Example: **+ACK:GTFVR,BD0200,868487004358800,,0012,20090214093254,11F0$**			
Parameter	**Length(byte)**	**Range/Format**	**Default**
QMS Protocol Version	6	XX0000 – XXFFFF, X∈{'A' –'Z','0' –'9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0'–'9''a'–'z''A'–'Z''-''_'	
Serial Number	4	0000 – FFFF	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

2.3. Report

This section defines the formats of the report messages. Due to the max length limit of an SMS message (160 bytes), it is recommended to carefully set the <*Report Composition Mask*> in **AT+GTCFG** to limit the length of the report which contains GNSS position information in case of SMS transmission. Otherwise the report will be truncated to fit the length of an SMS message.

2.3.1.Position Related Report

➢ **+RESP:GTOPB,**

After the IO combination is properly set, if the corresponding condition occurs, the device will send the report **+RESP:GTOPB** to the server.

➢ **+RESP:GTRTL,**

After the device receives the command **AT+GTRTO**, it will start GNSS to get the current position and then send the message **+RESP:GTRTL** to the backend server.

➢ **+RESP:GTDOG,**

The protocol watchdog reboot message.

➢ **+RESP:GTDIS,**

The status change of digital input is detected if the parameter <Mode> is set to 1 in the command **AT+GTDIS**.

➢ **+RESP:GTIGL,**

The location message for ignition on and ignition off.

All the reports above have the same format as shown below.

Example:
+RESP:GTOPB,BD0200,868487004358800,cv200,,00,1,1,0.0,0,116.0,114.015413,22.537223,20210715021020,0460,0001,25F8,061A7D02,,,20210715101020,0AB6$
+RESP:GTRTL,BD0200,868487004353181,cv200,,00,1,0,0.0,0,102.2,114.015295,22.537250,20210608063942,0460,0001,25F8,061A7D02,,0.0,20210608143939,32CF$
+RESP:GTDOG,BD0101,864292043419363,CV200,,02,1,1,0.0,0,134.1,114.015213,22.537073,20200527024442,0460,0001,2531,061A7D02,,0.8,20200527104442,0119$
+RESP:GTIGL,BD0200,868487004353181,cv200,,00,1,1,0.0,0,264.8,114.015502,22.537327,20210608064027,0460,0001,25F8,061A7D02,,0.0,20210608144025,32D1$
+RESP:GTDIS,DF0200,868487004353181,cv200,,00,1,1,0.0,0,264.8,114.015502,22.537327,20210608064027,0460,0001,25F8,061A7D02,,0.0,20210608144025,32D1$

Parameter	Length (Byte)	Range/Format	Default
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z','0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Reserved	0		
Report ID/Report Type	2	X(0-6)X(0-6)	
Number	1	0 – 1	
GNSS Accuracy	<=2	0|1 – 50	
Speed	<=5	0.0 – 999.9 km/h	
Azimuth	<=3	0 – 359	
Altitude	<=8	(–)xxxxx.x m	
Longitude	<=11	(–)xxx.xxxxxx	
Latitude	<=10	(–)xx.xxxxxx	
GNSS UTC Time	14	YYYYMMDDHHMMSS	
MCC	4	0XXX	
MNC	4	0XXX	
LAC	4	XXXX	
Cell ID	0|4|8	XXXXXXXX	
Reserved	0		
Mileage	<=9	0.0 – 4294967.0 km	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	

Tail Character	1	$	$

- <*Report ID/Report Type*>: It is a one-byte hexadecimal value represented by two ASCII bytes. The first byte (4 higher bits of the hexadecimal value) indicates Report ID and the second byte (4 lower bits of the hexadecimal value) indicates Report Type.
  Report ID has different meanings in different messages below.
  - In the **+RESP:GTDIS** report, it is the input ID.

  For other messages, it will always be 0.
  Report type has different meanings in different messages below.
  - In the **+RESP:GTOPB** report, it is the output ID
  - In the protocol watchdog reboot message **+RESP:GTDOG**
    1: Reboot message for time based working mode
    2: Reserved
    3: Reserved
    4: Reserved
    5: Reserved
  - In the ignition on/off location message **+RESP:GTIGL**
    0: Ignition off
    1: Ignition on
  - In the **+RESP:GTDIS** report message generated by the digital input
    0: The current logic status is active.
    1: The current logic status is Inactive.

  For other messages, it will always be 0.
- <*Number*>: The number of the GNSS position(s) included in the report message. Generally, it is 1.
- <*GNSS Accuracy*>: A numeral to indicate the GNSS fix status and HDOP of the GNSS position. 0 means the current GNSS fix fails and the last known GNSS position is used. A non-zero value (1 - 50) means the current GNSS fix is successful and represents the HDOP of the current GNSS position.
- <*Speed*>: The current speed. Unit: km/h.
- <*Azimuth*>: The azimuth of the GNSS fix.
- <*Altitude*>: The height above the sea level.
- <*Longitude*>: The longitude of the current position.
- <*Latitude*>: The latitude of the current position.
- <*GNSS UTC Time*>: The UTC time obtained from the GNSS chip.
- <*MCC*>: Mobile country code. It is 3 digits in length and ranges from 000 – 999.
- <*MNC*>: Mobile network code. It is 3 digits in length and ranges from 000 – 999.
- <*LAC*>: Location area code in hex format.
- <*Cell ID*>: Cell ID in hex format.
- <*Mileage*>: The current total mileage.

➢ **+RESP:GTHBM,**

If harsh behavior is detected, this message will be sent to the backend server.

➢ **+RESP:GTSOS,**

If the SOS Alarm is enabled, the device will send the report **+RESP:GTSOS** to the server when SOS event is triggered by function button.

➢ **+RESP:GTBTN,**

The report for when the function button is pressed.

All the reports above have the same format as shown below.

Example:
+RESP:GTHBM,BD0202,868487004359097,cv200,,20,1,1,0.0,0,103.7,114.015043,22.537022,20211019012930,0460,0001,25F8,061A7D02,,0.2,20211019092932,20211019092932,F340$
+RESP:GTSOS,BD0200,868487004358800,cv200,,00,1,1,0.0,0,138.0,114.015465,22.537372,20210714115224,0460,0001,25F8,061A7D02,,,20210714195224,20210714195224,03A6$
+RESP:GTBTN,BD0200,868487004358800,cv200,,00,1,1,0.0,0,407.3,114.015872,22.539113,20210714114838,0460,0001,25F8,061A7D02,,,20210714194838,20210714194838,039B$

Parameter	Length (Byte)	Range/Format	Default
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z','0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Reserved	0		
Report ID/Report Type	2	X(0-6)X(0-6)	
Number	1	0 – 1	
GNSS Accuracy	<=2	0|1 – 50	
Speed	<=5	0.0 – 999.9 km/h	
Azimuth	<=3	0 – 359	
Altitude	<=8	(–)xxxxx.x m	
Longitude	<=11	(–)xxx.xxxxxx	
Latitude	<=10	(–)xx.xxxxxx	
GNSS UTC Time	14	YYYYMMDDHHMMSS	
MCC	4	0XXX	
MNC	4	0XXX	
LAC	4	XXXX	
Cell ID	0|4|8	XXXXXXXX	
Reserved	0		

Mileage	<=9	0.0 – 4294967.0 km	
Event Time	14	YYYYMMDDHHMMSS	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

- <*MAC*>: It will report the MAC address when Bluetooth button is triggered. Otherwise, it is blank.
- <*Report ID/Report Type*>: It is a one-byte hexadecimal value represented by two ASCII bytes. The first byte (4 higher bits of the hexadecimal value) indicates Report ID and the second byte (4 lower bits of the hexadecimal value) indicates Report Type.
  Report ID has different meanings in different messages below.
  - For **+RESP:GTHBM**
    Report ID represents the level of driving behavior.
    0: Reserved
    1: Level 1
    For other messages, it will always be 0.

  Report type has different meanings in different messages below.
  - In the harsh behavior monitoring message **+RESP:GTHBM**
    0: Harsh braking behavior
    1: Harsh acceleration behavior
    2: Harsh cornering behavior

  For other messages, it will always be 0.
- <*Number*>: The number of the GNSS position(s) included in the report message. Generally, it is 1.
- <*GNSS Accuracy*>: A numeral to indicate the GNSS fix status and HDOP of the GNSS position. 0 means the current GNSS fix fails and the last known GNSS position is used. A non-zero value (1 - 50) means the current GNSS fix is successful and represents the HDOP of the current GNSS position.
- <*Speed*>: The current speed. Unit: km/h.
- <*Azimuth*>: The azimuth of the GNSS fix.
- <*Altitude*>: The height above the sea level.
- <*Longitude*>: The longitude of the current position.
- <*Latitude*>: The latitude of the current position.
- <*GNSS UTC Time*>: The UTC time obtained from the GNSS chip.
- <*MCC*>: Mobile country code. It is 3 digits in length and ranges from 000 – 999.
- <*MNC*>: Mobile network code. It is 3 digits in length and ranges from 000 – 999.
- <*LAC*>: Location area code in hex format.
- <*Cell ID*>: Cell ID in hex format.
- <*Mileage*>: The current total mileage.
- *<Event Time>:* The time when the event happens.

➢ **+RESP:GTFRI,**

If fixed report function is enabled, the device will send the message **+RESP:GTFRI** to the backend server according to the working mode.

Example: **+RESP:GTFRI,BD0200,868487004353181,cv200,14051,10,1,0,0.0,0,264.1,114.015515,22.537178,20210608064328,0460,0001,25F8,061A7D02,,0.0,,,,100,21,,,,20210608144354,32DB$**			
Parameter	**Length (Byte)**	**Range/Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z','0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
External Power Voltage	<=5	0 – 99999 mV	
Report ID/Report Type	2	X(1-5)X(0-6)	
Number	<=2	1	
GNSS Accuracy	<=2	0|1 – 50	
Speed	<=5	0.0 – 999.9 km/h	
Azimuth	<=3	0 – 359	
Altitude	<=8	(–)xxxxx.x m	
Longitude	<=11	(–)xxx.xxxxxx	
Latitude	<=10	(–)xx.xxxxxx	
GNSS UTC Time	14	YYYYMMDDHHMMSS	
MCC	4	0XXX	
MNC	4	0XXX	
LAC	4	XXXX	
Cell ID	0|4|8	XXXXXXXX	
Reserved	0		
Mileage	<=9	0.0 – 4294967.0 km	
Hour Meter Count	11	HHHHH:MM:SS	
Reserved	0		
Reserved	0		
Backup Battery Percentage	<=3	0 – 100	
Device Status	2	00 – FF	

Reserved	0		
Reserved	0		
Reserved	0		
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

- <*External Power Voltage*>: The voltage of the external power supply. The device will send the current voltage along with the **+RESP:GTFRI** message to the backend server.
- <*Report ID/Report Type*>: It indicates the working mode of the fixed report and the type of the message.

  Report ID has several meanings below.
  - 1: Fixed Time Report

  Report type has several meanings below.'
  - 0: Normal fixed report
  - 1: Corner report which indicates that the device just turns around a corner
  - 2: Reserved
  - 3: Reserved
  - 4: Reserved
  - 5: Reserved
  - 6: Reserved
- <*Number*>: The number of the GNSS position(s) included in the report message.
- <*Hour Meter Count*>: If the hour meter count function is enabled by the command **AT+GTHMC**, total hours the meter has counted when the engine is on will be reported in this field. It is formatted with 5 hour digits, 2 minute digits and 2 second digits, and ranges from 00000:00:00 – 99999:00:00. If the function is disabled, this field will be empty.
- <*Backup Battery Percentage*>: The current volume of the backup battery in percentage.
- <*Device Status*>: The state of the device. From left to right, the first two digits indicate the current motion status of the device, and the remaining four bits are reserved.
- The current motion status of the device:
  - 11 (Ignition Off Rest): The device attached vehicle is ignition off and it is motionless.
  - 12 (Ignition Off Motion): The device attached vehicle is ignition off and it is moving before it is considered as being towed.
  - 21 (Ignition On Rest): The device attached vehicle is ignition on and it is motionless.
  - 22 (Ignition On Motion): The device attached vehicle is ignition on and it is moving.

➢ **+RESP:GTERI,**

If **+RESP:GTERI** is enabled, the device will send the message **+RESP:GTERI** to the backend server instead of **+RESP:GTFRI**.

Example: **+RESP:GTERI,BD0210,864281043116186,CV200,00000100,14079,00,1,1,0.0,198,118.4,113.947963,22.573543,20230727023144,0460,0001,253E,06F75801,,0.0,,,,0,21,,,,,,,1,0,13,0,,7FFF,wms301,C55E083892F5,1,,,,,,,,,,,,,,0,20230727023144,0B27$**			
Parameter	**Length (Byte)**	**Range/Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈ {'A' – 'Z','0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' ' ' _'	
ERI Mask	8	00000000 – FFFFFFFF	00000000
External Power Voltage	<=5	0 – 99999 mV	
Report ID/Report Type	2	X(1-5)X(0-6)	
Number	<=2	1	
GNSS Accuracy	<=2	0|1 – 50	
Speed	<=5	0.0 – 999.9 km/h	
Azimuth	<=3	0 – 359	
Altitude	<=8	(–)xxxxx.x m	
Longitude	<=11	(–)xxx.xxxxxx	
Latitude	<=10	(–)xx.xxxxxx	
GNSS UTC Time	14	YYYYMMDDHHMMSS	
MCC	4	0XXX	
MNC	4	0XXX	
LAC	4	XXXX	
Cell ID	0|4|8	XXXXXXXX	
Reserved	0		
Mileage	<=9	0.0 – 4294967.0 km	
Hour Meter Count	11	HHHHH:MM:SS	
Reserved	0		
Reserved	0		
Backup Battery Percentage	<=3	0 – 100	
Device Status	2	00 – FF	

Reserved		0		
Reserved		0		
Reserved		0		
Reserved		0		
Bluetooth Accessory Data (Optional)	Bluetooth Accessory Number	<=2	0 – 10	
	Index	1	0 – 9	
	Accessory Type	2	3|6|13	
	Accessory Model	1	0 – 5	
	Reserved	0		
	Accessory Append Mask	<=4	0 – FFFF	
	Accessory Name (Optional)	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' ' ' '_'	
	Accessory MAC (Optional)	12	000000000000 – FFFFFFFFFFFF	
	Accessory Status (Optional)	1	0 - 1	
	Accessory Battery Level (Optional)	<=4	0 – 5000(mV)	
	Accessory Temperature (Optional)	<=3	-70 – 255	
	Accessory Humidity (Optional)	<=3	0 – 100%(rh)	
	Reserved1 (Optional)	0		
	Reserved2 (Optional)	0		
	Reserved3	0		

	(Optional)			
	Reserved4 (Optional)	0		
	Reserved5 (Optional)	0		
	Reserved6 (Optional)	0		
	Reserved7 (Optional)	0		
	Reserved8 (Optional)	0		
	Reserved9 (Optional)	0		
	Reserved10 (Optional)	0		
	Reserved11 (Optional)	0		
	Accessory Battery Percentage (Optional)	<=3	0 – 100%	
	Relay state (Optional)	1	0-1	
Send Time		14	YYYYMMDDHHMMSS	
Count Number		4	0000 – FFFF	
Tail Character		1	$	$

- <*Bluetooth Accessory Number*>: It indicates the number of accessories connected with the device.
- <*Index*>: The Index of the Bluetooth accessory.
- <*Accessory Type*>: The type of the Bluetooth accessory.
- <*Accessory Model*>: The model of the Bluetooth accessory.
- <*Accessory Name*>: The name of the Bluetooth accessory.
- <*Accessory MAC*>: The MAC address of the Bluetooth accessory.
- <*Accessory Status*>: It indicates the status of Bluetooth accessory.
  - 0: Unavailable.
  - 1: Available.
- <*Accessory Battery Level*>: It indicates the remaining level of the battery in Bluetooth

accessory.

- ✧ <*Accessory Temperature*>: It indicates the temperature measured by Bluetooth accessory.
- ✧ <*Accessory Battery Percentage*>: Percentage of Bluetooth accessory's battery power.
- ✧ <*Relay state*>: The current state of the relay sensor.
- ✧ <Reserved1 ~ 3>: It is controlled and reported by Bit7 of the <*Accessory Append Mask*>.
- ✧ <Reserved4 ~ 5>: It is controlled and reported by Bit8 of the <*Accessory Append Mask*>.
- ✧ <Reserved6 ~ 8>: It is controlled and reported by Bit9~11 of the <*Accessory Append Mask*>.
- ✧ <Reserved9 ~ 11>: It is controlled and reported by Bit12 of the <*Accessory Append Mask*>.

Note: The word "Optional" means the item is controlled by the parameter <*ERI Mask*> of the **AT+GTFRI** command.

➢ **+RESP:GTLBC,**

If the parameter <*Location by Call*> is enabled by the command **AT+GTCFG**, the device will get and send the current position to the backend server via the message **+RESP:GTLBC** when there is an incoming call.

Example: **+RESP:GTLBC,BD0200,868487004353181,cv200,+8615815595115,0,0.0,0,264.1,114.015515,22.537178,20210608065305,0454,0003,7C38,000992C5,,0.0,20210608145302,32F6$**			
Parameter	**Length (Byte)**	**Range/Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z','0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Call Number	<=20	phone number	
GNSS Accuracy	<=2	0|1 – 50	
Speed	<=5	0.0 – 999.9 km/h	
Azimuth	<=3	0 – 359	
Altitude	<=8	(–)xxxxx.x m	
Longitude	<=11	(–)xxx.xxxxxx	
Latitude	<=10	(–)xx.xxxxxx	
GNSS UTC Time	14	YYYYMMDDHHMMSS	
MCC	4	0XXX	
MNC	4	0XXX	
LAC	4	XXXX	
Cell ID	0|4|8	XXXXXXXX	

Reserved	0		
Mileage	<=9	0.0 – 4294967.0 km	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

✧ <*Call Number*>: The phone number of the incoming call which triggers the report message.

➢ **+RESP:GTGIN**

If Geo-fence/Peo-fence is configured and enabled, the device will send the report **+RESP:GTGIN** to the server according to the settings when the device enters the Geo-fence/Peo-fence.

➢ **+RESP:GTGOT**

If Geo-fence/Peo-fence is configured and enabled, the device will send the report **+RESP:GTGOT** to the server according to settings when the device exits the Geo-fence/Peo-fence.

Example:
+RESP:GTGIN,BD0200,867867432522526,,,,1,0,1,1,0.0,0,397.0,114.016165,22.537370,20210608032353,0460,0000,27BD,02C38D02,,,20210608112353,20210608112354,0239$
+RESP:GTGOT,BD0202,868487004358883,cv200,,,0,0,1,1,0.0,62,159.3,114.015718,22.537450,20210910014243,0460,0000,27BD,02C38D16,,500.5,20210910094239,20210910094244,01E8$

Parameter	Length (Byte)	Range/Format	Default
Protocol Version	6	XX0000 – XXFFFF,X∈{'A' – 'Z','0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0'–'9','a'–'z','A'–'Z','-','_'	
Reserved			
Reserved			
Area Type	1	0-1	
GEO ID/PEO ID Group	<=5	20bit 1-FFFFF (GEO ID/PEO ID 0 – 19)	
Number	1	0 – 1	
GPS Accuracy	<=2	0/1 – 50	
Speed	<=5	0.0 – 999.9 km/h	
Azimuth	<=3	0 – 359	
Altitude	<=8	(–)xxxxx.x m	

Longitude	<=11	(–)xxx.xxxxxx	
Latitude	<=10	(–)xx.xxxxxx	
GPS UTC Time	14	YYYYMMDDHHMMSS	
MCC	0/4	0XXX	
MNC	0/4	0XXX	
LAC	0/4	XXXX	
Cell ID	0/4/8	XXXXXXXX	
Reserved	0		
Mileage	<=9	0.0 – 4294967.0 km	
Event Time	14	YYYYMMDDHHMMSS	
Send Time	0/14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

- ✧ <Area Type>: 0-Polygon GEO; 1-Circle GEO.
- ✧ <GEO ID Group>: The bitwise mask for trigger condition composition of the corresponding GEO ID. Each bit, from bit 0 to bit 19, represents the logical state of the corresponding GEO ID to trigger the entering or exiting event.1 means that the event of the GEO ID set has been triggered and 0 means has not.

2.3.2.Device Information Report

If the device information report function is enabled by the command **AT+GTCFG**, the device will send the device information via the message **+RESP:GTOSI** to the backend server periodically.

- ➢ **+RESP:GTOSI,**

Example:
+RESP:GTOSI,BD0209,864281043116186,CV200,460095202112744,89860119801294226733,31,99,1,13541,,3.57,0,0,1,5,86,46,71,46,1,45,28,45,15,44,1,20230706085123,21,0707,30,105,4,104,0,20230706085122,0126$

Parameter	Length (Byte)	Range/Format	Default
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z','0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
IMSI	15	IMSI	

ICCID	20		
CSQ RSSI	<=2	0 – 31|99	
CSQ BER	<=2	0 – 7|99	
External Power Supply	1	0|1	
External Power Voltage	<=5	0 – 99999mV	
Reserved	0		
Backup Battery Voltage	<=4	0.0 – 4.35V	
Charging	1	0|1	
Battery Percentage	<=3	0-100	
GNSS On	1	0|1	
Satellites Number	1	0 – 5	
Satellite(i) ID	<=2		
Satellite(i) Power	<=2		
Last GNSS HDOP	<=2	0|1 – 50	
GNSS UTC Time	14	YYYYMMDDHHMMSS	
Vehicle State	1	11|12|21|22	
Recorder State	4	0000-FFFF	
TF Card State	2	202|200|201|00~99	
SIM Card State	3	101 – 105	
Cellular Network	1	0|1|2|3|4|5	
Network state	3	100-500	
Out Status	1	0|1	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

- <*ICCID*>: The ICCID of the SIM card.
- <*CSQ RSSI*>: The signal strength level.

CSQ RSSI	Signal Strength (dBm)
0	<-113
1	-111
2 – 30	-109 – -53
31	>-51

99	Unknown

- <*CSQ BER*>: The quality of the network signal. The range is 0-7, and 99 is for unknown signal strength.
- <*External Power Supply*>: Whether the external power supply is connected or not.
  - 0: Not connected
  - 1: Connected
- <*External Power Voltage*>: The voltage of the external power supply.
- <*Backup Battery Voltage*>: The voltage of the backup battery.
- <*Charging*>: Whether the backup battery is charging when the main power supply is connected.
  - 0: Not charging
  - 1: Charging
- <*GNSS On*>: A numeral to indicate whether the GNSS is working now.
  - 0: GNSS is not working now.
  - 1: GNSS is working now.
- <*Satellites Number*>: The number of visible satellites. The maximum value is 5. The top 5 satellites will be chosen according to the signal strength of the satellites if there are more than 5 visible satellites.
- <*Satellites (i) ID*>: The ID of the chosen visible satellites.
- <*Satellites (i) Power*>: The signal strength of the satellite whose ID is <*Satellites (i) ID*>. <*Satellites (i) ID*> and <*Satellites (i) Power*> are repeated according to the value of <*Satellites Number*>. If <*Satellites Number*> is 0, <*Satellites (i) ID*> and <*Satellites (i) Power*> do not exist.
- <*Last GNSS HDOP*>: A numeral to indicate GNSS position information and the HDOP of the latest successful GNSS position. If the device does not get the GNSS position since the first power on, this field will be 0.
- <*GNSS UTC time*>: The UTC time of the latest successful GNSS position in YYYYMMDDHHMMSS format. If the device does not get the GNSS position since the first power on, this filed will be empty.
- <*Vehicle State*>: The state of the vehicle.
  - 11: Ignition off and rest
  - 12: Ignition off and motion
  - 21: Ignition on and rest
  - 22: Ignition on and motion
- <*Recorder State*>: Bitwise mask to indicate which status of recorder.
  - Bit0: Front camera is connected
  - Bit1: Front camera recording is enabled
  - Bit2: Front camera recording
  - Bit3: Front camera recording by events
  - Bit4: Reserved
  - Bit5: Reserved
  - Bit6: Reserved
  - Bit7: Reserved
  - Bit8: Interior camera is connected

- Bit9: Interior camera recording is enabled
- Bit10: Interior camera recording
- Bit11: Interior camera recording by events
- Bit12: Reserved
- Bit13: Reserved
- Bit14: Reserved
- Bit15: Reserved

✧ *<TF Card State>*: The state of TF card.

- 202: Formatting
- 200: Card not exist
- 201: Card anomaly
- 00-99: Remaining capacity (%)

✧ *<SIM Card State>*: The state of SIM card.

- 101: SIM card not exist
- 102: Error
- 103: PIN locked
- 104: PUK locked
- 105: Normal

✧ *<Cellular Network>*: The state of cellular network.

- 0: Not Registered
- 1: Searching
- 2: GSM
- 3: WCDMA
- 4: 4G LTE
- 5: Other

✧ *<Network Status>*: The status of network.

- 100: Not connected
- 101: Local network (GSM)
- 102: Local network (WCDMA)
- 103: Local network (4G LTE CAT 4)
- 104: Local network (4G LTE CAT 6)
- 201: Roaming network (GSM)
- 202: Roaming network (WCDMA)
- 203: Roaming network (4G LTE CAT 4)
- 204: Roaming network (4G LTE CAT 6)
- 301: Wi-Fi 2.4GHz
- 302: Wi-Fi 5GHz

✧ *<Out Status>*: The status of output.

- 0: Low
- 1: High

2.3.3.Report for Real Time Querying

2.3.3.1. +RESP:GTGPS

After the device receives the command **AT+GTRTO** to read the GNSS information, it will send the

GNSS information to the backend server via the message **+RESP:GTGPS**.

➢ **+RESP:GTGPS,**

Example: **+RESP:GTGPS,BD0200,868487004353181,cv200,,,,007F,,,20210607071425,20210607151718,2D77$**			
Parameter	**Length (Byte)**	**Range/Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z','0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Reserved	0		
Reserved	0		
Reserved	0		
Report Composition Mask	4	0000 – FFFF	
Reserved	0		
Reserved	0		
Last Fix UTC Time	14	YYYYMMDDHHMMSS	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

✧ <*Report Composition Mask*>: Please refer to <*Report Composition Mask*> of the **AT+GTCFG** command.

2.3.3.2. +RESP:GTALM

After the device receives the command **AT+GTRTO** to read all the configurations, it will send all configurations to the backend server via **+RESP:GTALM** messages. This message is only sent via network. If the message is too long, then it will be subpackaged into several **+RESP:GTALM** messages.

➢ **+RESP:GTALM,**

Example:
+RESP:GTALM,BD0209,864281043116186,CV200,2,1,BSI,,,,,,,00,,,,,,,SRI,4,,1,218.17.50.142,905,,0,,0,2,,0,,,CFG,,CV200,1,0.0,0.0,,007F,1,,FFFF,,1,1,300,3,,,,000F,0,,TMA,+,00,00,0,,time.windows.com,,,,FRI,0,,,,,,,30,,,,0,600,,,,,GEO,0,0,0.000000,0.000000,50,0,,,,,,,,,1,0,0.000000,0.000000,50,0,,,,,,,,,2,0,0.000000,0.000000,50,0,,,,,,,,,3,0,0.000000,0.000000,50,0,,,,,,,,,4,0,0.000000,0.000000,50,0,,,,,,,,,5,0,0.000000,0.000000,50,0,,,,,,,,,6,0,0.000000,0.000000,50,0,,,,,,,,,7,0,0.000000,

0.000000,50,0,,,,,,,,8,0,0.000000,0.000000,50,0,,,,,,,,9,0,0.000000,0.000000,50,0,,,,,,,,10,0,0.000000,0.000000,50,0,,,,,,,,11,0,0.000000,0.000000,50,0,,,,,,,,12,0,0.000000,0.000000,50,0,,,,,,,,13,0,0.000000,0.000000,50,0,,,,,,,,14,0,0.000000,0.000000,50,0,,,,,,,,15,0,0.000000,0.000000,50,0,,,,,,,,16,0,0.000000,0.000000,50,0,,,,,,,,17,0,0.000000,0.000000,50,0,,,,,,,,18,0,0.000000,0.000000,50,0,,,,,,,,19,0,0.000000,0.000000,50,0,,,,,,,,SOS,0,,,0,,,,,,PIN,1,1234,,,,,DOG,1,,7,0200,,1,,,,,IDL,0,2,1,0,,,,,,,,,,HMC,0,00000:00:00,,,,,,,,HBM,0,200,,,,50,250,,,,40,30,50,,,,,,,,,WLT,0,1,1,,,,,,,,,,,,,CRA,0,15,23,,0,500,500,,0,,0,30,30,PDS,1,007F,,,,,,SSR,0,2,1,5,0,0,0,,DSS,1,1,0,2,10,,,1,,,,,2,1,0,5,100,,,1,,,,,3,1,36,3,10,,,1,,,,,4,1,0,2,10,,,1,,,,,5,1,0,10,10,,,1,,,,,ASC,30,5,5,,,,,,,,20230706074636,00FC$

+RESP:GTALM,BD0209,864281043116186,CV200,2,2,UPC,0,10,0,0,0,,0,,0,0,,3,PEO,0,0,,,,,,,,,,,,,,,,,,,0,,,,,,,,1,0,,,,,,,,,,,,,,,,,,,,,,0,,,,,,,,2,0,,,,,,,,,,,,,,,,,,,,,,0,,,,,,,,3,0,,,,,,,,,,,,,,,,,,,,,,0,,,,,,,,,4,0,,,,,,,,,,,,,,,,,,,,,,0,,,,,,,,5,0,,,,,,,,,,,,,,,,,,,,,,0,,,,,,,,,6,0,,,,,,,,,,,,,,,,,,,,,,0,,,,,,,,7,0,,,,,,,,,,,,,,,,,,,,,,0,,,,,,,,8,0,,,,,,,,,,,,,,,,,,,,,,0,,,,,,,,9,0,,,,,,,,,,,,,,,,,,,,,,0,,,,,,,,10,0,,,,,,,,,,,,,,,,,,,,,,0,,,,,,,,11,0,,,,,,,,,,,,,,,,,,,,,,,,0,,,,,,,,12,0,,,,,,,,,,,,,,,,,,,,,,0,,,,,,,,13,0,,,,,,,,,,,,,,,,,,,,,,0,,,,,,,,14,0,,,,,,,,,,,,,,,,,,,,,,0,,,,,,,,15,0,,,,,,,,,,,,,,,,,,,,,,,,0,,,,,,,,16,0,,,,,,,,,,,,,,,,,,,,,,0,,,,,,,,17,0,,,,,,,,,,,,,,,,,,,,,,0,,,,,,,,18,0,,,,,,,,,,,,,,,,,,,,,,0,,,,,,,,19,0,,,,,,,,,,,,,,,,,,,,,,0,,,,,,,,PPC,0,1,2,2,2,,,,REC,1,1F0000,6308,1,2,,2,,,1,0,0000,6308,,30,3,FSO,,21,queclink,,,0,0,,,,,queclink,0,WFS,1,queclink,12345678,queclink,12345678,,1,,,,OUT,,0,,,,,OPB,,0,0000,,1,0,0,0,0,0,,,VOL,1,1,1,7FF,0,,,,,,,,,OSP,0,60,60,,,,,,ODP,1,11300,6,,,,,OSD,0,12,0,+,00,00,0,,SSA,70,0,0,0,,,,,PRS,0,60,1,2,2,2,0,,20230706074636,00FD$

Parameter	Length (Byte)	Range/Format	Default
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z','0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Total Packets	2	10	
Current Packet	2	1 – 10	
Configurations	< 1500		
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

- <*Total Packets*>: The total number of **+RESP:GTALM**.
- <*Current Packet*>: The sequence number of the current packet.
- <*Configurations*>: The current configuration of the device.

Note: The length of every **+RESP:GTALM** message (including header and tail) should be no more than 1500 characters.

2.3.3.3. +RESP:GTALC

After the device receives the command **AT+GTRTO** to read all the configurations, it will send all configurations to the backend server via the message **+RESP:GTALC**. This message is only sent via network.

➢ **+RESP:GTALC,**

Example:

+RESP:GTALC,BD0209,864281043116186,CV200,70b,1,1,BSI,,,,,,00,,,,,,SRI,4,,1,218.17.50.142,905,,0,,0,2,,0,,,CFG,,CV200,1,0.0,0.0,,007F,1,,FFFF,,1,1,300,3,,,,000F,0,,TMA,+,00,00,0,,time.windows.com,,,,FRI,0,,,,,,,30,,,,0,600,,,,,GEO,0,0,0.000000,0.000000,50,0,,,,,,,,1,0,0.000000,0.000000,50,0,,,,,,,,2,0,0.000000,0.000000,50,0,,,,,,,,3,0,0.000000,0.000000,50,0,,,,,,,,4,0,0.000000,0.000000,50,0,,,,,,,,5,0,0.000000,0.000000,50,0,,,,,,,,6,0,0.000000,0.000000,50,0,,,,,,,,7,0,0.000000,0.000000,50,0,,,,,,,,8,0,0.000000,0.000000,50,0,,,,,,,,9,0,0.000000,0.000000,50,0,,,,,,,,10,0,0.000000,0.000000,50,0,,,,,,,,11,0,0.000000,0.000000,50,0,,,,,,,,12,0,0.000000,0.000000,50,0,,,,,,,,13,0,0.000000,0.000000,50,0,,,,,,,,14,0,0.000000,0.000000,50,0,,,,,,,,15,0,0.000000,0.000000,50,0,,,,,,,,16,0,0.000000,0.000000,50,0,,,,,,,,17,0,0.000000,0.000000,50,0,,,,,,,,18,0,0.000000,0.000000,50,0,,,,,,,,19,0,0.000000,0.000000,50,0,,,,,,,,20230706074727,0101$

+RESP:GTALC,BD0209,864281043116186,CV200,1bd800,1,2,SOS,0,,,,0,,,,,,PIN,1,1234,,,,,,DOG,1,,7,0200,,1,,,,,,IDL,0,2,1,0,,,,,,,,,,,,HMC,0,00000:00:00,,,,,,,,HBM,0,200,,,,50,250,,,,40,30,50,,,,,,,,,,WLT,0,1,1,,,,,,,,,,,,,,,CRA,0,15,23,,0,500,500,,0,,0,30,30,20230706074727,0102$

+RESP:GTALC,BD0209,864281043116186,CV200,401c2200000,1,3,PDS,1,007F,,,,,,,SSR,0,2,1,5,0,0,0,,DSS,1,1,0,2,10,,,1,,,,,2,1,0,5,100,,,1,,,,,3,1,36,3,10,,,1,,,,,4,1,0,2,10,,,1,,,,,5,1,0,10,10,,,1,,,,,ASC,30,5,5,,,,,,,,,UPC,0,10,0,0,0,,0,,0,0,,3,PEO,0,0,,,,,,,,,,,,,,,,,,,,,,0,,,,,,,,,1,0,,,,,,,,,,,,,,,,,,,,,,0,,,,,,,,2,0,,,,,,,,,,,,,,,,,,,,,,0,,,,,,,,3,0,,,,,,,,,,,,,,,,,,,,,,0,,,,,,,,4,0,,,,,,,,,,,,,,,,,,,,,,0,,,,,,,,5,0,,,,,,,,,,,,,,,,,,,,,,0,,,,,,,,,6,0,,,,,,,,,,,,,,,,,,,,,,0,,,,,,,,7,0,,,,,,,,,,,,,,,,,,,,,,0,,,,,,,,8,0,,,,,,,,,,,,,,,,,,,,,,0,,,,,,,,9,0,,,,,,,,,,,,,,,,,,,,,,0,,,,,,,,10,0,,,,,,,,,,,,,,,,,,,,,,0,,,,,,,,11,0,,,,,,,,,,,,,,,,,,,,,,0,,,,,,,,12,0,,,,,,,,,,,,,,,,,,,,,,0,,,,,,,,13,0,,,,,,,,,,,,,,,,,,,,,,0,,,,,,,,14,0,,,,,,,,,,,,,,,,,,,,,,0,,,,,,,,15,0,,,,,,,,,,,,,,,,,,,,,,0,,,,,,,,16,0,,,,,,,,,,,,,,,,,,,,,,0,,,,,,,,17,0,,,,,,,,,,,,,,,,,,,,,,0,,,,,,,,18,0,,,,,,,,,,,,,,,,,,,,,,0,,,,,,,,19,0,,,,,,,,,,,,,,,,,,,,,,0,,,,,,,,20230706074727,0103$

+RESP:GTALC,BD0209,864281043116186,CV200,ff000000000000,1,4,PPC,0,1,2,2,2,,,,REC,1,1F0000,6308,1,2,,2,,,1,0,0000,6308,,30,3,FSO,,21,queclink,,,0,0,,,,,queclink,0,WFS,1,queclink,12345678,queclink,12345678,,1,,,,OUT,,0,,,,,,OPB,,0,0000,,1,0,0,0,0,0,,,VOL,1,1,1,7FF,0,,,,,,,,,,20230706074727,0104$

+RESP:GTALC,BD0209,864281043116186,CV200,2f00000000000000,0,5,OSP,0,60,60,,,,,,ODP,1,11300,6,,,,,OSD,0,12,0,+,00,00,0,,SSA,70,0,0,0,,,,,PRS,0,60,1,2,2,2,0,,20230706074727,0105$

Parameter	Length (Byte)	Range/Format	Default
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z','0' – '9'}	
Unique ID	15	IMEI	

Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Configuration Mask	<=16	0000000000000000 – FFFFFFFFFFFFFFFF	
Next Packet	1	0-1	
Current Packet	<=2	1-20	
BSI	3	BSI	BSI
APN	<=40	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '.'	
APN User Name	<=30		
APN Password	<=30		
Reserved	0		
Reserved	0		
Reserved	0		
Network Mode/APN Authentication Methods	1	00-33	00
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
SRI	3	SRI	SRI
Report Mode	1	0 – 7	0
Reserved	0		
Buffer Mode	1	0|1|2	1
Main Server IP/Domain Name	<=60		
Main Server Port	<=5	0 – 65535	
Backup Server IP/Domain Name	<=60		
Backup Server Port	<=5	0 – 65535	
Reserved			
Heartbeat Interval	<=3	0|2 – 360 min	0

SACK Enable	1	0|1|2	0
Reserved			
SMS ACK Enable	1	0|1	0
Reserved	0		
Reserved	0		
CFG	3	CFG	CFG
New Password	4 – 20	'0' – '9' 'a' – 'z' 'A' – 'Z'	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	CV200
ODO Enable	1	0|1	0
ODO Initial Mileage	<=9	0.0 – 4294967.0Km	0.0
Total Mileage	<=9	0.0 – 4294967.0Km	0.0
Reserved	0		
Composition Mask	<=4	0 –007F	007F
Power Saving Mode	1	0 – 2	1
Reserved	0		
Event Mask	4	0000 – FFFF	FFFF
Reserved	0		
LED On	1	0|1	1
OSI Report Enable	1	0|1	0
OSI Report Interval	<=5	30 – 86400sec	300
Incoming Control	1	0|1|2|3|4	4
Reserved			
Reserved			
Reserved			
GSM Report	4	0000 – FFFF	000F
GNSS Lost Time	2	0 – 30 min	0
Reserved			
TMA	3	TMA	TMA
Sign	1	+|-	+
Hour Offset	<=2	0-12	0

Minute Offset	<=2	0-59	0
Daylight Saving	1	0|1	0
UTC Time	14	YYYYMMDDHHMMSS	
NTP Address	< 40		time.windows.com
Reserved	0		
Reserved	0		
Reserved	0		
FRI	3	FRI	FRI
Mode	1	0 – 5	
Reserved			
Reserved			
Reserved			
Reserved			
Reserved			
Reserved			
Send Interval	<=5	5 – 86400 sec	10
Reserved			
Reserved			
Reserved	0		
Corner Report	<=3	0 – 180	0
IGF Report Interval	<=5	0|5 – 86400 sec	600
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
GEO	3	GEO	GEO
GEO ID0	1	0	0
Mode	1	0 – 3	0
Longitude	<=11	-180 - 180	
Latitude	<=10	-90 - 90	

Radius	<=7	50 – 6000000 m	50
Check Interval	<=5	0 | 5 – 86400 sec	0
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
GEO ID1	1	1	1
Mode	1	0 – 3	0
Longitude	<=11	-180 - 180	
Latitude	<=10	-90 - 90	
Radius	<=7	50 – 6000000 m	50
Check Interval	<=5	0 | 5 – 86400 sec	0
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
GEO ID2	1	2	2
Mode	1	0 – 3	0
Longitude	<=11	-180 - 180	
Latitude	<=10	-90 - 90	
Radius	<=7	50 – 6000000 m	50
Check Interval	<=5	0 | 5 – 86400 sec	0

Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
GEO ID3	1	3	3
Mode	1	0 – 3	0
Longitude	<=11	-180 - 180	
Latitude	<=10	-90 - 90	
Radius	<=7	50 – 6000000 m	50
Check Interval	<=5	0 | 5 – 86400 sec	0
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
GEO ID4	1	4	4
Mode	1	0 – 3	0
Longitude	<=11	-180 - 180	
Latitude	<=10	-90 - 90	
Radius	<=7	50 – 6000000 m	50
Check Interval	<=5	0 | 5 – 86400 sec	0
Reserved	0		
Reserved	0		

Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
GEO ID5	1	5	5
Mode	1	0 – 3	0
Longitude	<=11	-180 - 180	
Latitude	<=10	-90 - 90	
Radius	<=7	50 – 6000000 m	50
Check Interval	<=5	0 | 5 – 86400 sec	0
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
GEO ID6	1	6	6
Mode	1	0 – 3	0
Longitude	<=11	-180 - 180	
Latitude	<=10	-90 - 90	
Radius	<=7	50 – 6000000 m	50
Check Interval	<=5	0 | 5 – 86400 sec	0
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		

Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
GEO ID7	1	7	7
Mode	1	0 – 3	0
Longitude	<=11	-180 - 180	
Latitude	<=10	-90 - 90	
Radius	<=7	50 – 6000000 m	50
Check Interval	<=5	0 | 5 – 86400 sec	0
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
GEO ID8	1	8	8
Mode	1	0 – 3	0
Longitude	<=11	-180 - 180	
Latitude	<=10	-90 - 90	
Radius	<=7	50 – 6000000 m	50
Check Interval	<=5	0 | 5 – 86400 sec	0
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		

Reserved	0		
Reserved	0		
GEO ID9	1	9	9
Mode	1	0 – 3	0
Longitude	<=11	-180 - 180	
Latitude	<=10	-90 - 90	
Radius	<=7	50 – 6000000 m	50
Check Interval	<=5	0 | 5 – 86400 sec	0
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
GEO ID10	2	10	10
Mode	1	0 – 3	0
Longitude	<=11	-180 - 180	
Latitude	<=10	-90 - 90	
Radius	<=7	50 – 6000000 m	50
Check Interval	<=5	0 | 5 – 86400 sec	0
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		

GEO ID11	2	11	11
Mode	1	0 – 3	0
Longitude	<=11	-180 - 180	
Latitude	<=10	-90 - 90	
Radius	<=7	50 – 6000000 m	50
Check Interval	<=5	0 | 5 – 86400 sec	0
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
GEO ID12	2	12	12
Mode	1	0 – 3	0
Longitude	<=11	-180 - 180	
Latitude	<=10	-90 - 90	
Radius	<=7	50 – 6000000 m	50
Check Interval	<=5	0 | 5 – 86400 sec	0
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
GEO ID13	2	13	13
Mode	1	0 – 3	0

Longitude	<=11	-180 - 180	
Latitude	<=10	-90 - 90	
Radius	<=7	50 – 6000000 m	50
Check Interval	<=5	0 | 5 – 86400 sec	0
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
GEO ID14	2	14	14
Mode	1	0 – 3	0
Longitude	<=11	-180 - 180	
Latitude	<=10	-90 - 90	
Radius	<=7	50 – 6000000 m	50
Check Interval	<=5	0 | 5 – 86400 sec	0
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
GEO ID15	2	15	15
Mode	1	0 – 3	0
Longitude	<=11	-180 - 180	
Latitude	<=10	-90 - 90	

Radius	<=7	50 – 6000000 m	50
Check Interval	<=5	0 | 5 – 86400 sec	0
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
GEO ID16	2	16	16
Mode	1	0 – 3	0
Longitude	<=11	-180 - 180	
Latitude	<=10	-90 - 90	
Radius	<=7	50 – 6000000 m	50
Check Interval	<=5	0 | 5 – 86400 sec	0
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
GEO ID17	2	17	17
Mode	1	0 – 3	0
Longitude	<=11	-180 - 180	
Latitude	<=10	-90 - 90	
Radius	<=7	50 – 6000000 m	50
Check Interval	<=5	0 | 5 – 86400 sec	0

Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
GEO ID18	2	18	18
Mode	1	0 – 3	0
Longitude	<=11	-180 - 180	
Latitude	<=10	-90 - 90	
Radius	<=7	50 – 6000000 m	50
Check Interval	<=5	0 | 5 – 86400 sec	0
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
GEO ID19	2	19	19
Mode	1	0 – 3	0
Longitude	<=11	-180 - 180	
Latitude	<=10	-90 - 90	
Radius	<=7	50 – 6000000 m	50
Check Interval	<=5	0 | 5 – 86400 sec	0
Reserved	0		
Reserved	0		

Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
SOS	3	SOS	SOS
Mode	1	0 – 4	0
Reserved	0		
SOS number	<=20		
SMS Gateway	<=20		
Auto Emergency Call	1	0|1	0
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
PIN	3	PIN	PIN
Enable Auto-unlock PIN	1	0|1	0
PIN	4 - 8	'0' – '9'	
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
DOG	3	DOG	DOG
Mode	1	0|1|2	1
Reserved			
Reboot Interval	<=2	1 – 30	7

Reboot Time	4	HHMM	0200
Reserved	0		
Report Before Reboot	1	0|1	1
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
IDL	3	IDL	IDL
Mode	1	0|1	0
Time to Idling	2	1 – 30 min	2
Time to Movement	1	1 – 5 min	1
Debounce Distance	<=4	0|100-9999m	0
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
HMC	3	HMC	HMC
Hour Meter Enable	1	0|1	0
Initial Hour Meter Count	11	00000:00:00-99999:00:00	00000:00:00
Reserved	0		
Reserved	0		
Reserved	0		

Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
HBM	3	HBM	HBM
Mode	1	0 -1	0
Acceleration Threshold	<=3	100-1500(cm/s/s)	200
Reserved			
Reserved			
Reserved			
Acceleration Duration	<=2	10-50(*10ms)	50
Deceleration Threshold	<=3	100-1500(cm/s/s)	250
Reserved			
Reserved			
Reserved			
Deceleration Duration	<=2	10-50(*10ms)	40
Cornering Threshold	<=4	30-1500	30
Cornering Duration	<=3	10-50(*10ms)	50
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
WLT	3	WLT	WLT

Call Filter	1	0 – 7	0
Phone Number Start	<=2	1-10	1
Phone Number End	<=2	1-10	1
White Number List	<=20*10		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
CRA	3	CRA	CRA
Mode	1	0-1	0
Crash Threshold	<=2	1 - 40	15
High Shock Sensitivity	<=2	Crash Threshold<= (X) <=40	23
Reserved	0		
Sampling Start	1	0|1	0
Samples Before Crash	4	1-1600	500
Samples After Crash	4	1-1600	500
Reserved			
Report Gyro Data	1	0|1	0
Reserved	0		
Add GNSS Data	1	0|1	0
GNSS Time Before Crash	3	0 – 120(x1s)	30
GNSS Time After Crash	3	0 – 120(x1s)	30
PDS	3	PDS	PDS
Mode	1	0|1|2	1
Mask	4	0000-FFFF	007F
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		

Reserved	0		
SSR	3	SSR	SSR
Mode	1	0|1	0
Time to Stop	<=4	(1– 30 min)|(5 – 1800 Sec)	2min
Time to Start	<=3	(1 – 5 min)|(5 – 300 Sec)	1min
Start Speed	2	1 – 10 Km/h	5
Long Stop	<=5	0 – 43200 min	0
Time Unit	1	0|1	0
Location Switch	1	0-1	0
Reserved	0		
ASC	3	ASC	ASC
Brake Speed Threshold	<=3	30 – 400km/h	30
Delta Speed Threshold	<=2	5 – 72km/h	5
Delta Heading Threshold	1	0-5	5
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
UPC	3	UPC	UPC
Max Download Retry	1	0 – 3	0
Download Timeout	<=2	5 – 30 min	10
Download Protocol	1	0|2	0
Report Enable	1	0|1	0
Update Interval	1	0 – 8760	0
Download URL	<=100	URL	

Mode	1	0|1	0
Reserved	0		
Extended Status Report	1	0|1	0
Identifier Number	8	00000000-FFFFFFFF	00000000
Reserved	0		
Update Status Mask	1	0 - 3	3
PEO	3	PEO	PEO
PEO ID	1	**0 – 19**	0
Mode	1	0 – 3	0
Reserved	0		
Reserved	0		
Longitude1	<=11	(–)xxx.xxxxxx	
Latitude1	<=10	(–)xx.xxxxxx	
…			
Longitude10	<=11	(–)xxx.xxxxxx	
Latitude10	<=10	(–)xx.xxxxxx	
Check Interval	<=5	0/5 – 86400sec	0
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
REC	3	REC	REC
Record Mode	1	0|1	1
Picture Event Mask	<=6	000000 - FFFFFF	0000
Video Event Mask	4	0000 – 63FF	6388
Record Audio	1	0|1	1

Video Quality of Front Camera	1	0|1|2	2
Reserved	0		
Video Quality of Interior Camera	1	0|1|2	2
Frame Rate	1	0|4	0
Reserved	0		
Interior Camera On	1	0|1	0
Recording Beep	1	0|1	0
Picture Upload Mask	<=6	000000 - FFFFFF	0000
Video Upload Mask	4	0000 – 63FF	6388
Reserved	0		
Event Recording Time	=2	10 - 30 seconds	30
Recording Time after Ignition Off	=1	3 – 5 minutes	3
FSO	3	FSO	FSO
FTP Server IP/Domain Name	< 40		
FTP Server Port	<=5	0 - 65535	21
Files Path	> 0 & < 60	'0' – '9' 'a' – 'z' 'A' – 'Z' `~!@#%^&()-_=+[{]}/.	queclink
FTP Username	< 40	'0' – '9' 'a' – 'z' 'A' – 'Z' `~!@#%^&*()-_=+[{]}|/?;:'"<>.	
FTP Password	< 40	'0' – '9' 'a' – 'z' 'A' – 'Z' `~!@#%^&*()-_=+[{]}|/?;:'"<>.	
FTP Mode	1	0|1|2	0
File Report	1	0|1	0
AWS Access Key ID	<=40	'0' – '9' 'a' – 'z' 'A' – 'Z' `~!@#%^&*()-_=+[{]}|/?;:'"<>.	
AWS Secret Access Key	<= 40	'0' – '9' 'a' – 'z' 'A' – 'Z' `~!@#%^&*()-_=+[{]}|/?;:'"<	

		>.	
AWS Bucket Name	< 40	'0' – '9' 'a' – 'z' 'A' – 'Z' `~!@#%^&*()-_=+[{]}|/?;:'"< >.	
AWS Region	< 40	'0' – '9' 'a' – 'z' 'A' – 'Z' `~!@#%^&*()-_=+[{]}|/?;:'"< >.	
AWS Files Path	< 60	'0' – '9' 'a' – 'z' 'A' – 'Z' `~!@#%^&()-_=+[{]}/.	queclink
Upload Mode	1	0|1	0
WFS	3	WFS	WFS
Mode	1	0|1|2	1
SSID	<=31	'0' – '9' 'a' – 'z' 'A' – 'Z' `~!@#%^&*()-_=+[{]}|/?;:'"< >.	queclink
PWD	8 – 63	'0' – '9' 'a' – 'z' 'A' – 'Z' `~!@#%^&*()-_=+[{]}|/?;:'"< >.	12345678
STA SSID	<=31	'0' – '9' 'a' – 'z' 'A' – 'Z' `~!@#%^&*()-_=+[{]}|/?;:'"< >.	queclink
STA PWD	8 – 63	'0' – '9' 'a' – 'z' 'A' – 'Z' `~!@#%^&*()-_=+[{]}|/?;:'"< >.	12345678
Reserved			
AP Band Mode	1	1,2	1
Reserved			
Reserved			
Reserved			
OUT	3	OUT	OUT
Reserved	0		
Long Operation1	<=3	0 – 120min	0
Reserved	0		
Reserved	0		

Reserved	0		
Reserved	0		
Reserved	0		
OPB	3	OPB	OPB
Reserved			
Mode	1	0|1	0
Event Mask	2	0000 - FFFF	0000
Reserved	0		
Output ID	1	1	1
Output Status	1	0 - 1	0
Duration	<=3	0 – 255(×100ms)	0
Toggle Times	<=3	0 – 255	0
Long Operation	<=3	0 – 120min	0
OPB Report	1	0|1	1
Reserved	0		
Reserved	0		
VOL	3	VOL	VOL
Multimedia Volume Levels	1	0-3	3
Call Volume Levels	1	0-3	3
Ring Volume Levels	1	0-3	1
TTS Alerts Mask	<=4	0000-FFFF	3FF
Voice Option	<=2	0	0
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		

Reserved	0		
Reserved	0		
VMS	3	VMS	VMS
Virtual Ignition Mode	1	0|1	0
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
OSP	3	OSP	OSP
Mode	1	0|1|2	1
Over Speed	<=3	0 – 200 km/h	100
Valid Time	<=4	0-3600s	60
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
ODP	3	ODP	ODP
Mode	1	0|1	0
Voltage Threshold	<=5	8000-32000 (mV)	11300
Debounce Time	2	1 – 6 (×10s)	6
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
OSD	3	OSD	OSD
Date Format	1	0|1|2	0
Display Mask	2	00-FF	0x12

Speed Measurement	1	0|1	0
OSD Sign	1	+|-	+
OSD Hour Offset	<=2	0-12	0
OSD Minute Offset	<=2	0-59	0
OSD Daylight Saving	1	0|1	0
Reserved	0		
SSA	3	SSA	SSA
Continuous Recording	2	50-100	70
Save G-sensor Data	1	0|1	0
Save GNSS Data	1	0|1	0
Data Overwrite Cycle	1	0|1|2|3	0
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
PRS	3	PRS	PRS
Camera Source	1	0|1|2|3	0
Picture Interval	2	60-3600 (s)	60
Front Camera Picture Resolution	1	0~3	1
Front Camera Compression Quality	1	0|1|2	2
Interior Camera Picture Resolution	1	1~3	2
Interior Camera Compression Quality	1	0|1|2	2
Upload By FTP	1	0|1	0
Reserved	0		
PPC	3	PPC	PPC
Mode	1	0|1	0
Front Camera Picture Resolution	1	0~3	1

Front Camera Compression Quality	1	0|1|2	2
Interior Camera Picture Resolution	1	1~3	2
Interior Camera Compression Quality	1	0|1|2	2
Reserved	0		
Reserved	0		
Reserved	0		
DSS	3	DSS	DSS
Event ID 1	1	1 – 7	1
Mode	1	0 – 1	0
Trigger Speed			
Trigger Duration			
Silent Duration			
Reserved	0		
Reserved	0		
Report Enable	1	0 – 1	1
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Event ID 2	1	1 – 7	2
Mode	1	0 – 1	0
Trigger Speed			
Trigger Duration			
Silent Duration			
Reserved	0		
Reserved	0		
Report Enable	1	0 – 1	1
Reserved	0		

Reserved	0		
Reserved	0		
Reserved	0		
Event ID 3	1	1 – 7	3
Mode	1	0 – 1	0
Trigger Speed			
Trigger Duration			
Silent Duration			
Reserved	0		
Reserved	0		
Report Enable	1	0 – 1	1
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Event ID 4	1	1 – 7	4
Mode	1	0 – 1	0
Trigger Speed			
Trigger Duration			
Silent Duration			
Reserved	0		
Reserved	0		
Report Enable	1	0 – 1	1
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Event ID 5	1	1 – 7	5
Mode	1	0 – 1	0
Trigger Speed			

Trigger Duration			
Silent Duration			
Reserved	0		
Reserved	0		
Report Enable	1	0 – 1	1
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
DIS	3	DIS	
Input ID	1	1	
Mode	1	0, 1, 2 , 3	0
Validatity Time	<=4	1-3000 (*10 ms)	10
Reserved	0		
Reserved	0		
URT	3	URT	URT
Working Mode	<=1	0 – 1	0
Baud Rate Index	<=2	1 – 12	12
Data Bits	1	7 – 8	8
Stop Bits	1	1 – 2	1
Parity Bits	1	0 – 2	0
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
BTS	3	BTS	BTS
Mode	1	0|1	1
Reserved	0		
Reserved	0		
Reserved	0		

Reserved	0		
Reserved	0		
Bluetooth Report Mask	<=4	0000 – FFFF	0902
Bluetooth Event Mask	<=4	0000 – FFFF	0003
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
BAS	3	BAS	BAS
Index	1	0 – 9	0
Accessory Type	<=2	0|6|13	0
Accessory Model	1	0|4	0
Accessory Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Accessory MAC	12	000000000000 – FFFFFFFFFFFF	FFFFFFFFFFFF
Accessory Append Mask	<=4	0 – FFFF	FFFF
Read Interval	<=5	10 – 86400(Sec)	30
Low Voltage Threshold	<=4	0 – 5000(mV)	2400
Reserved			
Accessory Parameters (Optional)			
Reserved			

Output ID	1	0 – 1	0
Output Status	1	0 – 1	
Duration	<=3	0 – 255(×100ms)	0
Toggle Times	<=3	0 – 255	0
Reserved			
Reserved			
BID	3	BID	BID
Index	1	0 – 2	0
Enable	1	0|1	0
Beacon ID Model	1	0	0
Accessory Append Mask	<=4	0000 – FFFF	000A
Low Voltage Threshold	<=4	0 – 5000(mV)	2400
Reserved	0		
Start Index	<=3	1 – 300	
End Index	<=3	1 – 300	
MAC List	<=12*75		
Reserved (Optional)	0		
Reserved (Optional)	0		
Reserved (Optional)	0		
Reserved (Optional)	0		
Reserved (Optional)	0		
Reserved	0		
Output ID	1	0 – 1	0
Output Status	1	0 – 1	0
Duration	<=3	0 – 255(×100ms)	0
Toggle Times	<=3	0 – 255	0
Reserved	0		
Reserved	0		
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	

Tail Character	1	$	$

✧ <*Next Packet*>: Whether the following information packet is the last one or not.
- 0: The following packet is the last information packet.
- 1: The following packet is not the last information packet.

✧ <*Current Packet*>: It indicates the index of **+RESP:GTALC**.

2.3.3.4. +RESP:GTALS

After the device receives the command **AT+GTRTO** to get sub AT command configuration information, it will send the configuration information to the backend server via the message **+RESP:GTALS**. Configuration information varies with different AT commands. For example, to get FRI configuration, set **AT+GTRTO=cv200,2,FRI,,,,,0015$**.

➢ **+RESP:GTALS,**

Example: +RESP:GTALS,BD0202,868487004358800,cv200,FRI,1,,,,,,,60,,,,20,120,,,,,20211018151234,AE48$			
Parameter	**Length (Byte)**	**Range/Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z','0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Sub AT Command	3	'a' – 'z' 'A' – 'Z' '	
Mode	1	0 – 1	1
Reserved			
Reserved			
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0	0	
Send Interval	<=5	5 – 86400 sec	30
Reserved	0		
Reserved	0		
Reserved	0		

Corner Report	<=3	0 – 180	0
IGF Report Interval	<=5	0|5-86400 sec	600
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

2.3.3.5. +RESP:GTCID

After the device receives the command **AT+GTRTO** to read the ICCID of the SIM card, it will send the ICCID to the backend server via the message **+RESP:GTCID**.

- **+RESP:GTCID,**

Example:
+RESP:GTCID,BD0200,868487004353181,cv200,89860119801294226659,20210608152216,335F$

Parameter	Length (Byte)	Range/Format	Default
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z','0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
ICCID	20		
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

2.3.3.6. +RESP:GTCSQ

After the device receives the command **AT+GTRTO** to read the GSM signal level, it will send the GSM signal level to the backend server via the message **+RESP:GTCSQ**.

- **+RESP:GTCSQ,**

Example:
+RESP:GTCSQ,BD0200,868487004353181,cv200,5,99,20210608152235,3361$

Parameter	Length (Byte)	Range/Format	Default
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z','0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
CSQ RSSI	<=2	0 – 31|99	
CSQ BER	<=2	0 – 7|99	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

✧ <*CSQ RSSI*>: The signal strength level.

CSQ RSSI	Signal Strength (dBm)
0	<-113
1	-111
2 – 30	-109 – -53
31	>-51
99	Unknown

✧ <*CSQ BER*>: The quality of the network signal. The range is 0-7, and 99 is for unknown signal strength.

2.3.3.7. +RESP:GTVER

After the device receives the command **AT+GTRTO** to get the versions (including firmware version, hardware version and module version), it will send the version information to the backend server by the message **+RESP:GTVER**.

➢ **+RESP:GTVER,**

Example: **+RESP:GTVER,BD0200,868487004353181,cv200,CV200,010A,0103,010101,011400,010105,20210608152253,3363$**			
Parameter	**Length (Byte)**	**Range/Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z','0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Device Type	10	'0' – '9' 'a' – 'z' 'A' – 'Z'	

Firmware Version	6	000000 – FFFFFF	
Hardware Version	4	0000 – FFFF	
Boot Version	6	000000 – FFFFFF	
Platform Version	6	000000 – FFFFFF	
MCU Version	6	000000 – FFFFFF	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

- <*Device Type*>: The type of the device.
- <*Firmware Version*>: The Android APP version. For example: **00010A** means the version **R00A01V10**.
- <*Hardware Version*>: The hardware version. The first two characters represent the major version and the last two characters represent the minor version. For example: **010A** means the version **1.10**.
- <*Boot Version*>: The Boot version. For example: **00010A** means the version **R00A01V0A**.
- <*Platform Version*>: The Platform version. For example: **010A00** means the version **1.10**.0
- <*MCU Version*>: The software version of the MCU. For example: 010102 means the version **R01A01V02.**

2.3.3.8. +RESP:GTBAT

After the device receives the command **AT+GTRTO** to read the power supply information, it will send the power supply information to the backend server via the message **+RESP:GTBAT**

- **+RESP:GTBAT,**

Example: **+RESP:GTBAT,BD0200,868487004353181,cv200,1,14060,,4.1,1,1,20210608152311,3365$**			
Parameter	**Length (Byte)**	**Range/Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z','0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
External Power Supply	1	0|1	
External Power Voltage	<=5	0 – 99999mV	
Reserved	0		
Backup Battery Voltage	<=4	0.0 – 4.35 V	

Charging	1	0|1	
LED On	1	0|1	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

2.3.3.9. +RESP:GTTMZ

After the device receives the command **AT+GTRTO** to get the time zone settings, it will send the time zone settings via the message **+RESP:GTTMZ** to the backend server.

- **+RESP:GTTMZ,**

Example: **+RESP:GTTMZ,BD0200,868487004353181,cv200,+0800,0,20210608152332,3367$**			
Parameter	**Length (Byte)**	**Range/Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z','0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Time Zone Offset	5	±HHMM	
Daylight Saving	1	0|1	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

2.3.3.10. +RESP:GTAIF

After the device receives the command **AT+GTRTO** to get the **AIF**, it will send the information by the report **+RESP:GTAIF** to the server.

- **+RESP:GTAIF,**

Example: **+RESP:GTAIF,BD0200,868487004353181,cv200,1234,,,,,,89860119801294226659,5,99,000992C5,172.21.220.52,202.106.195.68,202.106.46.151,,,,2,20210608153141,3373$**			
Parameter	**Length (Byte)**	**Range/Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z','0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	

APN	<=40	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '.'	
APN User Name	<=30		
APN Password	<=30		
Reserved			
Reserved			
Reserved			
ICCID	20		
CSQ RSSI	<=2	0 – 31	
CSQ BER	<=2	0 – 7/99	
Cell ID	0|4|8	XXXXXXXX	
IP Address	<=15	0.0.0.0	
Main DNS	<=15	0.0.0.0	
Backup DNS	<=15	0.0.0.0	
Reserved	0		
Reserved	0		
Reserved	0		
Network Type	1	0-3	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

✧ <CSQ RSSI>: The signal strength level.

CSQ RSSI	Signal Strength (dBm)
0	<-133
1	-111
2 – 30	-109 – -53
31	>-51

✧ <CSQ BER>: The strength of the signal. The range is 0-7 and 99 means unknown.

✧ <Cell ID>: Cell ID in hex format.

✧ <IP Address>: The IP address of the device.

✧ <Main DNS>: The main DNS server.

✧ <Backup DNS>: The backup DNS server.

✧ <Network Type>: Current network type.

- 0: Unregistered.
- 2: WCDMA

- 3: LTE
- 4: Other

2.3.3.11. +RESP:GTGSV

After the device receives the command to get satellite information, it will send the satellite information via the message **+RESP:GTGSV** to the backend server.

➢ **+RESP:GTGSV,**

Example: **+RESP:GTGSV,BD0200,868487004353181,cv200,21,0,43,1,42,2,41,3,40,4,35,5,33,6,30,7,29,8,27,9,25,10,25,11,25,12,25,13,19,14,19,15,17,16,17,17,14,18,13,19,10,20,0,20210608193446,3498$**			
Parameter	**Length (Byte)**	**Range/Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z','0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
SV Count	2	0-24	
SV ID	3	>= 0	
SV Power	3	>= 0	
… … …			
SV ID	3		
SV Power	3		
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

✧ <*SV Count*>: The count of satellites the GPS finds.

✧ <*SV ID*>: The satellite ID. In case of no satellite, the field is filled with zero.

✧ <*SV Power*>: Satellite power. In case of no satellite, the field is filled with zero.

2.3.3.12. +RESP:GTSCS

After the device receives the command **AT+GTRTO** to get the calibration data, it will send the calibration data via the message **+RESP:GTSCS** to the backend server.

➢ **+RESP:GTSCS,**

Example: **+RESP:GTSCS,BD0112,868487004352472,,1,0.00,0.00,0.00,0.00,0.00,0.00,0.00,0.00,0.00,20210**

315165355,24C9$			
Parameter	**Length (Byte)**	**Range/Format**	**Default**
Protocol Version	6	XX0000–XXFFFF, X∈{'A'–'Z','0'–'9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z''-''_'	
Self Calibration Status	1	0|1|2	
X_Forward	<=5	-1.00 - 1.00	
Y_Forward	<=5	-1.00 - 1.00	
Z_Forward	<=5	-1.00 - 1.00	
X_Side	<=5	-1.00 - 1.00	
Y_Side	<=5	-1.00 - 1.00	
Z_Side	<=5	-1.00 - 1.00	
X_Vertical	<=5	-1.00 - 1.00	
Y_Vertical	<=5	-1.00 - 1.00	
Z_Vertical	<=5	-1.00 - 1.00	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

- <*Self Calibration Status*>: The status of the self-calibration for <*Acceleration Data*>.
  - 0: Self-calibration is disabled.
  - 1: Self-calibration is not done.
  - 2: Self-calibration is successful.
- <*X_Forward*>, <*Y_Forward*>, <*Z_Forward*>: The factors to calculate the new acceleration in forward direction. The formula to calculate the acceleration in Forward direction Xnew is Xnew = <*X_Forward*> * X + <*Y_Forward*> * Y + <*Z_Forward*> * Z.
- <*X_Side*>, <*Y_Side*>, <*Z_Side*>: The factors to calculate the new acceleration in side direction. The formula to calculate the acceleration in Side direction Ynew is Ynew = <*X_Side*> * X + <*Y_Side*> * Y + <*Z_Side*> * Z.
- <*X_Vertical*>, <*Y_Vertical*>, <*Z_Vertical*>: The factors to calculate the new acceleration in vertical direction. The formula to calculate the acceleration in Vertical direction Znew is Znew = <*X_Vertical*> * X + <*Y_Vertical*> * Y + <*Z_Vertical*> * Z.

Note: When <*Self Calibration Status*> is 0 or 1, no calibration factor of the acceleration data will be included in the **+RESP:GTSCS** message. When <*Self Calibration Status*> is 2, the calibration

factors of the acceleration data will be included in the **+RESP:GTSCS** message.

2.3.3.13. +RESP:GTVDO

After the device receives the command **AT+GTRTO (subcommand = 38)** to get the video, it will send the result via the message **+RESP:GTVDO** to the backend server.

➢ **+RESP:GTVDO,**

Example: **+RESP:GTVDO,BD0202,868487004359097,cv200,110,2,20211012162427,CE01$**			
Parameter	**Length (Byte)**	**Range/Format**	**Default**
Protocol Version	6	XX0000–XXFFFF, X∈{'A'–'Z','0'–'9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z''-''_'	
Code Status	3		
Video Source	<=35		
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

✧ <*Code Status*>: The status of query. A numeral to indicate whether the query is handled successfully.

- 1X0: Such as 100 or 110. The query command is confirmed by the device.
- 1X1: Such as 101 or 111. The query command is refused by the device.
- 1X2: Such as 102 or 112. Other query command is running. Please try again later
- 2X0: Such as 200 or 210. The device has prepared the specified file.
- 2X1: Such as 201 or 211. The device cannot prepare the specified file.
- 3X0: Such as 300 or 310. The device starts to upload file.
- 3X1: Such as 301 or 311. The device finishes to upload file.
- 3X2: Such as 302 or 312. The device fails to upload file.

Note: X means <*Query Type*>.

✧ <*Video Source*>: it indicates the video file uploaded to media server. For example: **20211008_110000_F0_1** (extended name not attached)

2.3.3.14. +RESP:GTSOD

After the device receives the command **AT+GTRTO (subcommand = 3A)** to configure the RTMP server, it will send the result via the message **+RESP:GTSOD** to the backend server.

➢ **+RESP:GTSOD,**

Example: **+RESP:GTSOD,BD0202,868487004358800,cv200,100,0,20211020163736,BA46$**			
Parameter	**Length (Byte)**	**Range/Format**	**Default**
Protocol Version	6	XX0000–XXFFFF, X∈{'A'–'Z','0'–'9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z''-''_'	
Code Status	3		
Video Source	<=35		
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

- <*Code Status*>: The status of operations. A numeral to indicate whether the operation is executed successfully.
  - 1X0: Push streaming successfully
    1X1: The streaming is in process
    1X2: URL isn't reachable
    1X3: Unknown anomaly
    1X4: File not exist (Only <Streaming Type> = 1 or 2 or 3)
    125: Generating file (Only <Streaming Type> = 2)
    126: Generating file fails (Only <Streaming Type> = 2) (If successful, it will return 120)
    1X7: System is busy, try again later
    1x8:TF card was removed, request was denied (Only <Streaming Type> = 1 or 2 or 3)
  - 2X0: Close streaming successfully
    2X1: Close streaming failed
    2X2: Unknown anomaly
    2X3: File not exist (Only <Streaming Type> = 1)
    2x4: System is busy, try again later
    Note: X means <Streaming type>
- <*Video Source*>: if <Streaming Type> = 0, it indicates the live streaming of front or interior camera to be requested. If <Streaming Type> = 1 or 2, it indicates the video file uploaded to media server. For example: **20211008_110000_00_1** (extended name not attached);

2.3.3.15. +RESP:GTPIC

After the device receives the command **AT+GTRTO (subcommand = 3B)** to get picture, it will send the result via the message **+RESP:GTPIC** to the backend server.

- **+RESP:GTPIC,**

Example: **+RESP:GTPIC,BD0209,864281043115485,CV200,100,20230704_130505_01_2,,,,,,,,2023070506 5422,005F$**			
Parameter	**Length (Byte)**	**Range/Format**	**Default**
Protocol Version	6	XX0000–XXFFFF, X∈{'A'–'Z','0'–'9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z''-''_'	
Code Status	3		
Picture Source	<=35		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

✧ <*Code Status*>: The status of query. A numeral to indicate whether the query is handled successfully.

- 1X0: The query command is successful.
- 1X1: The query command fails.
- 2X0: Upload picture successful
- 2X1: Upload picture fails.

Note: X means <*Query Type*>.

✧ <*Picture Source*>:it indicates the picture file uploaded to media server. For example: **20211008_110000_F0_1** (extended name not attached).

2.3.3.16. +RESP:GTRFQ

➢ **+RESP:GTRFQ**

Example:

+RESP:GTRFQ,BD0203,868487004377701,CV200,1,1,1,20211206_062239_00_1.mp4-79000 ,20211206172814,0132$			
Parameter	**Length (Byte)**	**Range/Format**	**Default**
Protocol Version	6	XX0000–XXFFFF, X∈{'A'–'Z','0'–'9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z''-''_'	
Record Count	<=2	0-50	
Total Frame	<=2	0-64	
Frame Number	<=2	0-64	
Record N	<32	e.g: 20211120_150943_01_2.jpg -20	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

- <*Record Count*>: How many query results are there on this page. Maximum 50 records.
- <*Total Frame*>: The total pages of result.
- <*Frame Number*>: The current number of pages.
- <*Record N*>: Comment for each data item content, “file name–file size”, the default unit of file size is KB. e.g: 20211120_150943_01_2.jpg-20.

2.3.4.Event Report

The following event reports are triggered when certain events occur.

+RESP:GTPNA: Power on report. It indicates CPU reset or power on.

+RESP:GTPFA: Power off report. It indicates that the CPU is about to lose power.

+RESP:GTPDP: Wireless connection establishment report

+RESP:GTMPN: The report for connecting main power supply

+RESP:GTMPF: The report for disconnecting main power supply

+RESP:GTBTC: Backup-battery-starts-charging report

+RESP:GTSTC: Backup-battery-stops-charging report

+RESP:GTBPL: Backup battery low

+RESP:GTSTT: Device motion status indication when the motion status changes

+RESP:GTIGN: Ignition on report

+RESP:GTIGF: Ignition off report

+RESP: GTVGN: Virtual ignition on report

+RESP: GTVGF: Virtual ignition off report

+RESP:GTIDN: Enter into idling status

+RESP:GTIDF: Leave idling status
+RESP:GTSTR: Vehicle enters into start status
+RESP:GTSTP: Vehicle enters into stop status
+RESP:GTLSP: Vehicle enters into long stop status
+RESP:GTGSM: The report for the information of the serving cell and the neighbor cells
+RESP:GTGSS: GNSS signal status
+RESP:GTCRA: Crash incident report
+RESP:GTUPC: Over-the-air configuration update status
+RESP:GTEUC: Over-the-air configuration update status (Enhanced)
+RESP:GTASC: The report for calibration result.
+RESP:GTOSP: The report for over-speed
+RESP:GTODP: Inform the user to protect the vehicle battery over low
+RESP:GTPSG: The report for parking safeguard
+RESP:GTDSA: The report for device status alert.
+RESP:GTFTP: Reporting location information after transferring a file to FTP server.
+RESP:GTAWS: Reporting location information after transferring a file to AWS server.
+RESP:GTDSS: Reporting the driver status alarm information.
+RESP:GTDAR: Reporting the states of DSS activation.
+RESP:GTBAA: Temperature alarm, low voltage alarm or button event for Bluetooth accessory
+RESP:GTBID: The report for detection of Bluetooth beacon accessories
+RESP:GTBCS: The report for Bluetooth connection
+RESP:GTBDS: The report for Bluetooth disconnection

In **+RESP:GTMPN**, **+RESP:GTMPF**, **+RESP:GTBTC**, **+RESP:GTSTC**, **+RESP:GTBPL**, **+RESP:GTSTT**, **+RESP:GTIGN**, **+RESP:GTIGF**, **+RESP:GTIDN**, **+RESP:GTIDF**, **+RESP:GTSTR**, **+RESP:GTSTP**, **+RESP:GTLSP**, and **+RESP:GTGSS** event reports, the last known GNSS information and the current network information are included.

- **+RESP:GTPNA,**
- **+RESP:GTPFA,**
- **+RESP:GTPDP,**

Example:
+RESP:GTPNA,BD0200,868487004353181,cv200,20210608151218,3337$
+RESP:GTPFA,BD0200,868487004353181,cv200,20210608151145,3334$
+RESP:GTPDP,BD0200,868487004353181,cv200,20210608145225,32F2$

Parameter	Length (Byte)	Range/Format	Default
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z','0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Send Time	14	YYYYMMDDHHMMSS	

Count Number	4	0000 – FFFF	
Tail Character	1	$	$

- **+RESP:GTMPN,**
- **+RESP:GTBTC,**

Example:
+RESP:GTMPN,BD0200,868487004353181,cv200,50,0.0,0,264.1,114.015515,22.537178,20210608065450,0454,0003,7C38,000992C5,,20210608145455,32FF$
+RESP:GTBTC,BD0200,868487004353181,cv200,0,0.0,244,96.0,114.015203,22.537047,20210608071250,0454,0003,7C38,000992C5,,20210608151252,333B$

Parameter	Length (Byte)	Range/Format	Default
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z','0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
GNSS Accuracy	<=2	0|1 – 50	0, Last known
Speed	<=5	0.0 – 999.9 km/h	
Azimuth	<=3	0 – 359	
Altitude	<=8	(–)xxxxx.x m	
Longitude	<=11	(–)xxx.xxxxxx	
Latitude	<=10	(–)xx.xxxxxx	
GNSS UTC Time	14	YYYYMMDDHHMMSS	
MCC	4	0XXX	
MNC	4	0XXX	
LAC	4	XXXX	
Cell ID	0|4|8	XXXXXXXX	
Reserved	0		
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

- **+RESP:GTMPF,**

Example: **+RESP:GTMPF,BD0200,868487004353181,cv200,0,0.0,0,264.1,114.015515,22.537178,20210608065305,0454,0003,7C38,000992C5,,20210608145445,20210608145445,32F8$**			
Parameter	**Length (Byte)**	**Range/Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z','0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
GNSS Accuracy	<=2	0|1 – 50	0, Last known
Speed	<=5	0.0 – 999.9 km/h	
Azimuth	<=3	0 – 359	
Altitude	<=8	(–)xxxxx.x m	
Longitude	<=11	(–)xxx.xxxxxx	
Latitude	<=10	(–)xx.xxxxxx	
GNSS UTC Time	14	YYYYMMDDHHMMSS	
MCC	4	0XXX	
MNC	4	0XXX	
LAC	4	XXXX	
Cell ID	0|4|8	XXXXXXXX	
Reserved	0		
Event Time	14	YYYYMMDDHHMMSS	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

➢ **+RESP:GTSTC,**

Example: **+RESP:GTSTC,BD0200,868487004353181,cv200,,50,0.0,0,96.5,114.015200,22.537027,20210608071532,0454,0003,7C38,000992C5,,20210608151533,3341$**			
Parameter	**Length (Byte)**	**Range/Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z','0' – '9'}	
Unique ID	15	IMEI	

Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Reserved	0		
GNSS Accuracy	<=2	0|1 – 50	0, Last known
Speed	<=5	0.0 – 999.9 km/h	
Azimuth	<=3	0 – 359	
Altitude	<=8	(–)xxxxx.x m	
Longitude	<=11	(–)xxx.xxxxxx	
Latitude	<=10	(–)xx.xxxxxx	
GNSS UTC Time	14	YYYYMMDDHHMMSS	
MCC	4	0XXX	
MNC	4	0XXX	
LAC	4	XXXX	
Cell ID	0|4|8	XXXXXXXX	
Reserved	0		
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

➢ **+RESP:GTBPL,**

Example: **+RESP:GTBPL,BD0200,868487004353181,cv200,3.75,50,0.0,0,120.0,114.015298,22.537202,20210608091147,0460,0001,25F8,061A7D02,,20210608171242,340E$**			
Parameter	**Length (Byte)**	**Range/Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z','0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Backup Battery Voltage	<=4	0.0 – 4.35 V	
GNSS Accuracy	<=2	0|1 – 50	0, Last known
Speed	<=5	0.0 – 999.9 km/h	
Azimuth	<=3	0 – 359	
Altitude	<=8	(–)xxxxx.x m	

Longitude	<=11	(–)xxx.xxxxxx	
Latitude	<=10	(–)xx.xxxxxx	
GNSS UTC Time	14	YYYYMMDDHHMMSS	
MCC	4	0XXX	
MNC	4	0XXX	
LAC	4	XXXX	
Cell ID	0|4|8	XXXXXXXX	
Reserved	0		
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

➢ **+RESP:GTSTT,**

Example: **+RESP:GTSTT,BD0200,868487004353181,cv200,21,50,0.0,0,264.1,114.015515,22.537178,20210608065450,0454,0003,7C38,000992C5,,20210608145454,32FD$**			
Parameter	**Length (Byte)**	**Range/Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z','0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Motion Status	2	11|12|21|22	
GNSS Accuracy	<=2	0|1 – 50	0, Last known
Speed	<=5	0.0 – 999.9 km/h	
Azimuth	<=3	0 – 359	
Altitude	<=8	(–)xxxxx.x m	
Longitude	<=11	(–)xxx.xxxxxx	
Latitude	<=10	(–)xx.xxxxxx	
GNSS UTC Time	14	YYYYMMDDHHMMSS	
MCC	4	0XXX	
MNC	4	0XXX	
LAC	4	XXXX	

Cell ID	0|4|8	XXXXXXXX	
Reserved	0		
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

✧ <*Motion Status*>: The current motion status of the device.

- 11 (Ignition Off Rest): The device attached vehicle is ignition off and it is motionless.
- 12 (Ignition Off Motion): The device attached vehicle is ignition off and it is moving before it is considered as being towed.
- 21 (Ignition On Rest): The device attached vehicle is ignition on and it is motionless.
- 22 (Ignition On Motion): The device attached vehicle is ignition on and it is moving.

➢ **+RESP:GTIGN,+RESP:GTVGN**

Example: **+RESP:GTIGN,BD0200,868487004353181,cv200,,0,8,50,0.0,0,264.1,114.015515,22.537178,20210608065450,0454,0003,7C38,000992C5,,,0.0,20210608145454,20210608145454,32FB$**			
Parameter	**Length (Byte)**	**Range/Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z','0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Reserved	2	00	
Report Type	1	0	0
Duration of Ignition Off	<=6	0 – 999999 sec	
GNSS Accuracy	<=2	0|1 – 50	0, Last known
Speed	<=5	0.0 – 999.9 km/h	
Azimuth	<=3	0 – 359	
Altitude	<=8	(–)xxxxx.x m	
Longitude	<=11	(–)xxx.xxxxxx	
Latitude	<=10	(–)xx.xxxxxx	
GNSS UTC Time	14	YYYYMMDDHHMMSS	
MCC	4	0XXX	

MNC	4	0XXX	
LAC	4	XXXX	
Cell ID	0|4|8	XXXXXXXX	
Reserved	0		
Hour Meter Count	11	HHHHH:MM:SS	
Mileage	<=9	0.0 – 4294967.0 km	
Event Time	14	YYYYMMDDHHMMSS	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

- <*Duration of Ignition Off*>: Duration since last time the ignition is turned off. If the duration is greater than 999999 seconds, it will be reported as 999999 seconds.
- <*Hour Meter Count*>: If the hour meter counter function is enabled by the command **AT+GTHMC**, total hours the meter has counted when the engine is on will be reported in this field. If the function is disabled, this field will be empty. It is formatted with 5 hour digits, 2 minute digits and 2 second digits, and ranges from 00000:00:00 – 99999:00:00.

➢ **+RESP:GTIGF,+RESP:GTVGF**

Example: **+RESP:GTIGF,BD0200,868487004353181,cv200,,0,138,1,0.0,0,243.5,114.015730,22.537502,20210608065548,0454,0003,7C38,000992C5,,,0.0,20210608145712,20210608145712,3303$**			
Parameter	**Length (Byte)**	**Range/Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z','0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Reserved	2	00	
Report Type	1	0	0
Duration of Ignition On	<=6	0 – 999999 sec	
GNSS Accuracy	<=2	0|1 – 50	0, Last known
Speed	<=5	0.0 – 999.9 km/h	
Azimuth	<=3	0 – 359	
Altitude	<=8	(–)xxxxx.x m	

Longitude	<=11	(–)xxx.xxxxxx	
Latitude	<=10	(–)xx.xxxxxx	
GNSS UTC Time	14	YYYYMMDDHHMMSS	
MCC	4	0XXX	
MNC	4	0XXX	
LAC	4	XXXX	
Cell ID	0|4|8	XXXXXXXX	
Reserved	0		
Hour Meter Count	11	HHHHH:MM:SS	
Mileage	<=9	0.0 – 4294967.0 km	
Event Time	14	YYYYMMDDHHMMSS	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

- <*Duration of Ignition On*>: Duration since last time the ignition is turned on. If the duration is greater than 999999 seconds, it will be reported as 999999 seconds.
- <*Hour Meter Count*>: If the hour meter count function is enabled by the command **AT+GTHMC**, total hours the meter has counted when the engine is on will be reported in this field. If the function is disabled, this field will be empty. It is formatted with 5 hour digits, 2 minute digits and 2 second digits, and ranges from 00000:00:00 – 99999:00:00.

- **+RESP:GTIDN,**
- **+RESP:GTSTR,**
- **+RESP:GTSTP,**
- **+RESP:GTLSP,**

Example:

+RESP:GTIDN,BD0200,868487004353181,cv200,,,0,0.0,0,96.5,114.015388,22.537102,20210608090021,0460,0001,25F8,061A7D02,,0.0,20210608170220,33F0$$

+RESP:GTSTR,BD0101,865084030279549,CV200,,,1,27.8,13,100.7,116.443233,23.978543,20200520021120,0460,0000,2493,16F9,,532.5,20200520101122,2EF6$

+RESP:GTSTP,BD0101,865084030279549,CV200,,,1,0.0,13,100.7,116.533253,24.336344,20200520030121,0460,0000,2493,16F9,,573.3,20200520110123,2F18$

+RESP:GTLSP,BD0101,865084030279549,CV200,,,1,0.0,0,100.7,116.408520,23.879734,20200520010008,0460,0000,2493,16FA,,520.4,20200520090008,2E61$

Parameter	Length (Byte)	Range/Format	Default

Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z','0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Reserved	0		
Reserved	0		
GNSS Accuracy	<=2	0|1 – 50	0, Last known
Speed	<=5	0.0 – 999.9 km/h	
Azimuth	<=3	0 – 359	
Altitude	<=8	(–)xxxxx.x m	
Longitude	<=11	(–)xxx.xxxxxx	
Latitude	<=10	(–)xx.xxxxxx	
GNSS UTC Time	14	YYYYMMDDHHMMSS	
MCC	4	0XXX	
MNC	4	0XXX	
LAC	4	XXXX	
Cell ID	0|4|8	XXXXXXXX	
Reserved	0		
Mileage	<=9	0.0 – 4294967.0 km	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

➢ **+RESP:GTIDF,**

Example:
+RESP:GTIDF,BD0200,868487004353181,cv200,11,81,1,0.0,0,96.5,114.015388,22.537102,20210608090021,0460,0001,25F8,061A7D02,,0.0,20210608170342,33F3$

Parameter	Length (Byte)	Range/Format	Default
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z','0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Motion Status	2	11|12|21|22	

Duration of Idling Status	<=6	0 – 999999 sec	
GNSS Accuracy	<=2	0|1 – 50	0, Last known
Speed	<=5	0.0 – 999.9 km/h	
Azimuth	<=3	0 – 359	
Altitude	<=8	(–)xxxxx.x m	
Longitude	<=11	(–)xxx.xxxxxx	
Latitude	<=10	(–)xx.xxxxxx	
GNSS UTC Time	14	YYYYMMDDHHMMSS	
MCC	4	0XXX	
MNC	4	0XXX	
LAC	4	XXXX	
Cell ID	0|4|8	XXXXXXXX	
Reserved	0		
Mileage	<=9	0.0 – 4294967.0 km	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

- ✧ <*Motion Status*>: The current motion status when the vehicle leaves idling status.
- ✧ <*Duration of Idling Status*>: The period of time during which the vehicle has been in idling status. If the duration is greater than 999999 seconds, it will be reported as 999999 seconds.

➢ **+RESP:GTGSM,**

Example: **+RESP:GTGSM,BD0200,868487004353181,cv200,FRI,,,20210607102147,26D4$**			
Parameter	**Length (Byte)**	**Range/Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{'A'-'Z','0'-'9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Fix Type	3	SOS|RTL|LBC|FRI|GIR	
MCC1	4	0XXX	

MNC1	4	0XXX	
LAC1	4		
Cell ID1	0|4|8	XXXXXXXX	
RX Level1	2	0-63	
Reserved	0		
MCC2	4	0XXX	
MNC2	4	0XXX	
LAC2	4		
Cell ID2	0|4|8	XXXXXXXX	
RX Level2	2	0-63	
Reserved	0		
MCC3	4	0XXX	
MNC3	4	0XXX	
LAC3	4		
Cell ID3	0|4|8	XXXXXXXX	
RX Level3	2	0-63	
Reserved	0		
MCC4	4	0XXX	
MNC4	4	0XXX	
LAC4	4		
Cell ID4	0|4|8	XXXXXXXX	
RX Level4	2	0-63	
Reserved	0		
MCC5	4	0XXX	
MNC5	4	0XXX	
LAC5	4		
Cell ID5	0|4|8	XXXXXXXX	
RX Level5	2	0-63	
Reserved	0		
MCC6	4	0XXX	

MNC6	4	0XXX	
LAC6	4		
Cell ID6	0|4|8	XXXXXXXX	
RX Level6	2	0-63	
Reserved	0		
MCC	4	0XXX	
MNC	4	0XXX	
LAC	4		
Cell ID	0|4|8	XXXXXXXX	
RX Level	2	0-63	
Reserved	0		
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

- <*Fix Type*>: A string to indicate what kind of GNSS fix this cell information is for.
  "SOS": This cell information is for SOS requirement.
  "RTL": This cell information is for RTL request.
  "LBC": This cell information is for LBC request.
  "FRI": This cell information is for FRI request.
  "GIR": This cell information is for the sub command "**C**" in the **AT+GTRTO** command.
- <*MCC(i)*>: MCC of the neighbor cell *i* (*i* is the index of the neighbor cell).
- <*MNC(i)*>: MNC of the neighbor cell *i*.
- <*LAC(i)*>: LAC (in hex format) of the neighbor cell *i*.
- <*Cell ID(i)*>: Cell ID (in hex format) of the neighbor cell *i*.
- <*RX Level(i)*>: The signal strength of the neighbor cell *i*. This parameter is a 6-bit value coded in 1 dB steps:
  0: -110 dBm
  1 to 62: -109 to -48 dBm
  63: -47 dBm
- <*MCC*>: MCC of the serving cell.
- <*MNC*>: MNC of the serving cell.
- <*LAC*>: LAC (in hex format) of the serving cell.
- <*Cell ID*>: Cell ID (in hex format) of the serving cell.
- <*RX Level*>: The signal strength of the serving cell.

Note:

1. It may include information of several neighbor cells (or even no neighbor cell information). If

no neighbor cell is found, all the fields of the neighbor cell will be empty.

2. "ffff" in the fields of <*LAC(i)*> and <*Cell ID(i)*> means the device does not know the value.
3. This message cannot be sent via SMS.

➢ **+RESP:GTGSS,**

Example: **+RESP:GTGSS,BD0200,868487004353181,cv200,0,21,21,,1,0.0,0,119.4,114.015282,22.537247,20210607014426,0454,0003,7C38,00098E6D,,20210607094924,269F$**			
Parameter	**Length (Byte)**	**Range/Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z','0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
GNSS Signal Status	1	0 | 1	
Satellite Number	2	0 - 24	
Motion Status	2	11|12|21|22	
Reserved	0		
GNSS Accuracy	<=2	0|1 – 50	0, Last known
Speed	<=5	0.0 – 999.9 km/h	
Azimuth	<=3	0 – 359	
Altitude	<=8	(–)xxxxx.x m	
Longitude	<=11	(–)xxx.xxxxxx	
Latitude	<=10	(–)xx.xxxxxx	
GNSS UTC Time	14	YYYYMMDDHHMMSS	
MCC	4	0XXX	
MNC	4	0XXX	
LAC	4		
Cell ID	0|4|8		
Reserved	0		
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

✧ <*GNSS Signal Status*>: 0 means "GNSS signal lost or no successful GNSS fix", and 1 means

"GNSS signal recovered and successful GNSS fix".

✧ <*Satellite Number*>: The number of the visible satellites when fix is successful. If fix fails, the parameter is empty.

✧ <*Motion Status*>: The current motion status of the device.

- 11 (Ignition Off Rest): The device attached vehicle is ignition off and it is motionless.
- 12 (Ignition Off Motion): The device attached vehicle is ignition off and it is moving before it is considered as being towed.
- 21 (Ignition On Rest): The device attached vehicle is ignition on and it is motionless.
- 22 (Ignition On Motion): The device attached vehicle is ignition on and it is moving.

➢ **+RESP:GTCRA,**

Example: **+RESP:GTCRA,BD0203,864292043419363,CV200,01,1,0.0,0,92.7,114.015250,22.536880,20211103015758,0460,0001,25F8,061A7D02,0,20211103015758,20211103015758,31D2$**			
Parameter	**Length (Byte)**	**Range/Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z','0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Crash Counter	2	00-FF	
GNSS Accuracy	<=2	0|1 – 50	0, Last known
Speed	<=5	0.0 – 999.9 km/h	
Azimuth	<=3	0 – 359	
Altitude	<=8	(–)xxxxx.x m	
Longitude	<=11	(–)xxx.xxxxxx	
Latitude	<=10	(–)xx.xxxxxx	
GNSS UTC Time	14	YYYYMMDDHHMMSS	
MCC	4	0XXX	
MNC	4	0XXX	
LAC	4		
Cell ID	0|4|8		
Crash Type	1	0|1	1
Event Time	14	YYYYMMDDHHMMSS	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	

Tail Character	1	$	$

✧ <*Crash Counter*>: A parameter to indicate the crash sequence. The two report messages **+RESP:GTCRA** and **+RESP:GTCRD** are combined into one crash event. It rolls from 0x00 to 0xFF.

✧ <*Crash Type*>: 0: Normal Crash; 1: High Shock

➢ **+RESP:GTPSG,**

Example: **+RESP:GTPSG,BD0101,864292043419363,CV200,,1,0.0,0,123.8,114.015487,22.537203,20200527040059,0460,0001,2531,061A7D02,,20200527120102,20200527120102,024A$**			
Parameter	**Length (Byte)**	**Range/Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z','0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Reserved			
GNSS Accuracy	<=2	0|1 – 50	0, Last known
Speed	<=5	0.0 – 999.9 km/h	
Azimuth	<=3	0 – 359	
Altitude	<=8	(–)xxxxx.x m	
Longitude	<=11	(–)xxx.xxxxxx	
Latitude	<=10	(–)xx.xxxxxx	
GNSS UTC Time	14	YYYYMMDDHHMMSS	
MCC	4	0XXX	
MNC	4	0XXX	
LAC	4		
Cell ID	0|4|8		
Reserved			
Event Time	14	YYYYMMDDHHMMSS	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

➢ **+RESP:GTUPC,**

Example: **+RESP:GTUPC,BD0200,868487004353181,cv200,0,100,http://218.17.46.11:89/CV200/deltabin/556.CV200,20210608162850,33B4$**			
Parameter	**Length (Byte)**	**Range/Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z','0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Command ID	1		
Result	3	100|101|102|103|200|201|202|300|301|302|304|305|306	
Download URL	<=100	Complete URL	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000-FFFF	
Tail Character	1	$	$

✧ <*Command ID*>: The command ID in the update configuration file. It is always 0 before the device starts to update device configuration. It indicates the total number of the commands when the response result code is 301. It indicates wrong format of command ID when the response result code is 302.

✧ <*Result*>: A numeral to indicate whether the configuration is updated successfully.

- 100: The update command is starting.
- 101: The update command is confirmed by the device.
- 102: The update command is refused by the device.
- 103: The update process is refused because the battery is low.
- 200: The device starts to download the package.
- 201: The device finishes downloading the package successfully.
- 202: The device fails to download the package.
- 300: The device starts to update the device configuration.
- 301: The device finishes updating the device configuration successfully.
- 302: The device fails to update the device configuration.
- 304: Reserved.
- 305: The update process is interrupted by reboot.
- 306: The update process is interrupted by MD5 verification error.

✧ <*Download URL*>: The complete URL to download the configuration. It includes the file name.

➢ **+RESP:GTEUC,**

Example: **+RESP:GTEUC,BD0200,868487004353181,cv200,0,100,http://218.17.46.11:89/CV200/deltabin/556.CV200,0,,,,,20210608163006,33BC$**			
Parameter	**Length (Byte)**	**Range/Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z', '0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=10	'0'-'9', 'a'-'z', 'A'-'Z'	
Command ID	<=3		
Result	3	100|101|102|103|200|201|202|300|301|302|304|305|306	
Download URL	<=100	Complete URL	
Identifier Number	<=8	000000000-FFFFFFFF	
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000-FFFF	
Tail Character	1	$	$

✧ <*Command ID*>: The command ID in the update configuration file. It is always 0 before the device starts to update the configuration. It indicates the total number of the commands when the response code is 301. It indicates wrong format of command ID when the response code is 302.

✧ <*Result*>: A numeral to indicate whether the configuration is updated successfully.

- 100: The update command is starting.
- 101: The update command is confirmed by the device.
- 102: The update command is refused by the device.
- 103: The update process is refused because the battery is low.
- 200: The device starts to download the package.
- 201: The device finishes downloading the package successfully.
- 202: The device fails to download the package.
- 300: The device starts to update the device configuration.
- 301: The device finishes updating the device configuration successfully.
- 302: The device fails to update the device configuration.
- 303: Reserved
- 304: <*Command Mask*>, <*GEO ID Mask*>, <*Stocmd ID Mask*> or <*Group ID Mask*> check fails.
- 305: The update process is interrupted by abnormal reboot.
- 306: The update process is interrupted by MD5 verification error.

✧ <*Download URL*>: The complete URL to download the configuration. It includes the file

name.

✧ <*Identifier Number*>: Please refer to the parameter <*Identifier Number*> in the command **AT+GTUPC**.

➢ **+RESP:GTASC,**

Example: **+RESP:GTASC,BD0101,864292043419363,CV200,-0.92,0.36,-0.12,0.37,0.93,0.01,0.12,-0.03,-0.99,1,0.0,0,123.8,114.015510,22.537185,20200527053511,0460,0001,2531,061A7D02,,20200527133515,0364$**			
Parameter	**Length (Byte)**	**Range/Format**	**Default**
Protocol Version	6	XX0000–XXFFFF, X∈{'A'–'Z','0'–'9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z''-''_'	
X_Forward	<=5	-1.00-1.00	
Y_Forward	<=5	-1.00-1.00	
Z_Forward	<=5	-1.00-1.00	
X_Side	<=5	-1.00-1.00	
Y_Side	<=5	-1.00-1.00	
Z_Side	<=5	-1.00-1.00	
X_Vertical	<=5	-1.00-1.00	
Y_Vertical	<=5	-1.00-1.00	
Z_Vertical	<=5	-1.00-1.00	
GNSS Accuracy	<=2	0|1 – 50	
Speed	<=5	0.0 –999.9 km/h	
Heading	<=3	0 – 359	
Altitude	<=8	(–)xxxxx.x m	
Longitude	<=11	(–)xxx.xxxxxx	
Latitude	<=10	(–)xx.xxxxxx	
GNSS UTC Time	14	YYYYMMDDHHMMSS	
MCC	4	0XXX	
MNC	4	0XXX	
LAC	4		

Cell ID	0|4|8		
Reserved	0		
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

- ✧ <*X_Forward*>, <*Y_Forward*>, <*Z_Forward*>: The factors to calculate the new acceleration in forward direction. The formula to calculate the acceleration in Forward direction Xnew is Xnew = <*X_Forward*> * X + <*Y_Forward*> * Y + <*Z_Forward*> * Z.
- ✧ <*X_Side*>, <*Y_Side*>, <*Z_Side*>: The factors to calculate the new acceleration in side direction. The formula to calculate the acceleration in Side direction Ynew is Ynew = <*X_Side*> * X + <*Y_Side*> * Y + <*Z_Side*> * Z.
- ✧ <*X_Vertical*>, <*Y_Vertical*>, <*Z_Vertical*>: The factors to calculate the new acceleration in vertical direction. The formula to calculate the acceleration in Vertical direction Znew is Znew = <*X_Vertical*> * X + <*Y_Vertical*> * Y + <*Z_Vertical*> * Z.

➢ **+RESP:GTOSP,**

Example: **+RESP:GTOSP,BD0200,868487004353181,cv200,1,1.4,220,99.3,114.015193,22.537122,20210608114034,0460,0001,25F8,061A7D02,,20210608194035,20210608194035,34A5$**			
Parameter	**Length (Byte)**	**Range/Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z','0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
GNSS Accuracy	<=2	0|1 – 50	0, Last known
Speed	<=5	0.0 – 999.9 km/h	
Azimuth	<=3	0 – 359	
Altitude	<=8	(–)xxxxx.x m	
Longitude	<=11	(–)xxx.xxxxxx	
Latitude	<=10	(–)xx.xxxxxx	
GNSS UTC Time	14	YYYYMMDDHHMMSS	
MCC	4	0XXX	
MNC	4	0XXX	
LAC	4		

Cell ID	0|4|8		
Reserved	0		
Event Time	14	YYYYMMDDHHMMSS	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

➢ **+RESP:GTODP,**

Example: **+RESP:GTODP,BD0200,868487004353181,cv200,0,0.0,0,101.7,114.015478,22.537152,20210608084648,0460,0001,25F8,061A7D02,11355,,20210608164904,33DC$**			
Parameter	**Length (Byte)**	**Range/Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z','0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
GNSS Accuracy	<=2	0	0, Last known
Speed	<=5	0.0 – 999.9 km/h	
Azimuth	<=3	0 – 359	
Altitude	<=8	(–)xxxxx.x m	
Longitude	<=11	(–)xxx.xxxxxx	
Latitude	<=10	(–)xx.xxxxxx	
GNSS UTC Time	14	YYYYMMDDHHMMSS	
MCC	4	0XXX	
MNC	4	0XXX	
LAC	4		
Cell ID	0|4|8		
Voltage	5	00000-99999	Current voltage
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

✧ *<Voltage>*: The current voltage of the vehicle.

➢ **+RESP:GTDSA**

Example: **+RESP:GTDSA,BD0200,868487004353181,cv200,1,1.4,220,99.3,114.015193,22.537122,20210608114034,0460,0001,25F8,061A7D02,,20210608194035,20210608194035,34A5$**			
Parameter	**Length (Byte)**	**Range/Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z','0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
GNSS Accuracy	<=2	0|1 – 50	0, Last known
Speed	<=5	0.0 – 999.9 km/h	
Azimuth	<=3	0 – 359	
Altitude	<=8	(–)xxxxx.x m	
Longitude	<=11	(–)xxx.xxxxxx	
Latitude	<=10	(–)xx.xxxxxx	
GNSS UTC Time	14	YYYYMMDDHHMMSS	
Alarm Type	3		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

✧ *<Alarm Type>:* The type of Alarm.

- 101: The SIM card is removed
- 102: The SIM card is faulty
- 103: The SIM card is locked by PIN
- 104: The SIM card is locked by PUK
- 105: The SIM card is normal
- 200: The TF card is removed
- 201: The TF card cannot be accessed
- 202: The TF card is formatting

- 203: The TF card is normal
- 300: Front camera is normal
- 301: Front camera is faulty
- 400: Interior camera is normal
- 401: Interior camera is faulty
- 402: Interior camera is removed
- 403: Interior camera is blocking (Only valid when the DMS module is activated.)

➢ **+RESP:GTFTP, +RESP:GTAWS**

Example: **+RESP:GTFTP,BD0205,868487004358867,CV200,0,20220308_012218_09_1.jpg,1,0.0,0,462.4,114.017737,22.538473,20220308012221,0460,0001,25F8,061A7D02,,20220308012221,35D7$**			
Parameter	**Length (Byte)**	**Range/Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z','0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Upload State	1	0|1|2	
File Name	<=40	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
GNSS Accuracy	<=2	0	0, Last known
Speed	<=5	0.0 – 999.9 km/h	
Azimuth	<=3	0 – 359	
Altitude	<=8	(–)xxxxx.x m	
Longitude	<=11	(–)xxx.xxxxxx	
Latitude	<=10	(–)xx.xxxxxx	
GNSS UTC Time	14	YYYYMMDDHHMMSS	
MCC	4	0XXX	
MNC	4	0XXX	
LAC	4		
Cell ID	0|4|8		
Reserved	0		
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

✧ *<Upload State>: The upload state.*

- 0: FTP upload is started
- 1: FTP upload is finished
- 2: FTP upload fails

✧ *< File Name>:* The name of the upload file.

Note: +RESP: GTFTP is not applicable to the FTP upload triggered by RTO-PIC, RTO-VDO commands.

➢ **+RESP:GTDSS,**

Example: **+RESP:GTDSS,BD0209,864281043116186,CV200,5,1,0.0,102,105.9,113.947954,22.573559,20230706071000,0460,0001,253E,06F75801,,,20230706071000,20230706071000,00E0$**			
Parameter	**Length (Byte)**	**Range/Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z','0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Event ID	1	1-8	
GNSS Accuracy	<=2	0	0, Last known
Speed	<=5	0.0 – 999.9 km/h	
Azimuth	<=3	0 – 359	
Altitude	<=8	(–)xxxxx.x m	
Longitude	<=11	(–)xxx.xxxxxx	
Latitude	<=10	(–)xx.xxxxxx	
GNSS UTC Time	14	YYYYMMDDHHMMSS	
MCC	4	0XXX	
MNC	4	0XXX	
LAC	4		
Cell ID	0|4|8		
Reserved			
Reserved	0		
Event Time	14	YYYYMMDDHHMMSS	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	

Tail Character	1	$	$

✧ <Event ID>*:* Refer to AT+GTDSS command.

➢ **+RESP:GTDAR**

Example: **+RESP:GTDAR,BD0209,864281043116186,CV200,1,1,1,1,,,,20230630084231,,,,,20230706084725,0124$**			
Parameter	**Length (Byte)**	**Range/Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z','0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Feature Type	1	1	1
Activation Status	1	0-1	0
Calibration Status	1	0-1	0
Working Mode	1	0-1	0
Reserved	0		
Reserved	0		
Reserved	0		
Activation Time	14	YYYYMMDDHHMMSS	
Calibration Time	14	YYYYMMDDHHMMSS	
Reserved	0		
Reserved	0		
Reserved	0		
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

✧ <Feature Type>*: Driver assistance type*.

- *1: DMS*

✧ <Activation Status>: Indicates the license activation status of the feature, 1 means valid.

✧ <Calibration Status>: Indicates which type of driver status event, 1 means calibrated.

✧ <Working Mode>: The working mode of the feature type, 1 means enabled. Refer to AT+GTDSS command.

✧ <Activation Time>: Record the moment of the license activation.

✧ <Calibration Time>: Record the moment when the feature type calibration is successfully

completed.

- **+RESP:GTBCS,**

Example: **+RESP:GTBCS,BD0210,864281043116186,CV200,,0,0.0,198,117.7,113.947949,22.573551,20230727025115,0460,0001,253E,06F75801,,,0FFF,,64:C4:03:AF:91:CC,0,,C5:5E:08:38:92:F5,,,,,20230727025240,0B92$**			
Parameter	**Length (byte)**	**Range/Format**	**Default**
Protocol Version	6	(HEX)	
Unique ID	15	(IMEI)	
Device Name	<=20	'0' - '9', 'a' - 'z', 'A' - 'Z', '-', '_'	
Reserved	0		
GNSS Accuracy	1	0	
Speed	<=5	0.0 - 999.9(km/h)	
Azimuth	<=3	0 - 359	
Altitude	<=8	(-)XXXXX.X(m)	
Longitude	<=11	-180 - 180	
Latitude	<=10	-90 - 90	
GNSS UTC Time	14	YYYYMMDDHHMMSS	
MCC	4	0XXX	
MNC	4	0XXX	
LAC	4	(HEX)	
Cell ID	0|4|8	(HEX)	
Reserved	0		
Reserved	0		
Bluetooth Report Mask	4	(HEX)	
Reserved	0		
Bluetooth Mac Address	12	(HEX)	
Peer Role	1	0|1	
Reserved	0		
Peer MAC Address	12	(HEX)	
Reserved	0		

Reserved	0		
Reserved	0		
Reserved	0		
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	(HEX)	
Tail Character	1	$	$

✧ <*Peer Role*>: The role type of the peripheral device.

- 0: Master
- 1: Slave

➢ **+RESP:GTBDS,**

Example:
+RESP:GTBDS,BD0210,864281043116186,CV200,,0,0.0,326,117.6,113.947932,22.573556,20230727032057,0460,0001,253E,06F75801,,,0FFF,,64C403AF91CC,0,,D05B0A38E1F7,0,,,,20230727032058,0C47$

Parameter	Length (byte)	Range/Format	Default
Protocol Version	6	(HEX)	
Unique ID	15	(IMEI)	
Device Name	<=20	'0' - '9', 'a' - 'z', 'A' - 'Z', '-', '_'	
Reserved	0		
GNSS Accuracy	1	0	
Speed	<=5	0.0 - 999.9(km/h)	
Azimuth	<=3	0 - 359	
Altitude	<=8	(-)XXXXX.X(m)	
Longitude	<=11	-180 - 180	
Latitude	<=10	-90 - 90	
GNSS UTC Time	14	YYYYMMDDHHMMSS	
MCC	4	0XXX	
MNC	4	0XXX	
LAC	4	(HEX)	
Cell ID	0|4|8	(HEX)	
Reserved	0		

Reserved	0		
Bluetooth Report Mask	4	(HEX)	
Reserved	0		
Bluetooth Mac Address	12	(HEX)	
Peer Role	1	0|1	
Reserved	0		
Peer MAC Address	12	(HEX)	
Reason	1	0|4	
Reserved	0		
Reserved	0		
Reserved	0		
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	(HEX)	
Tail Character	1	$	$

- ✧ <*Peer Role*>: The role type of the peripheral device.
  - 0: Master
  - 1: Slave
- ✧ <*Reason*>: This parameter indicates the reason of Bluetooth disconnection.
  - 0x00: Normal disconnection.
  - 0x04: Bluetooth peripheral device pairing fail.

The event report message **+RESP:GTBAA** uses the format below.

Example:
+RESP:GTBAA,BD0210,864281043116186,CV200,0,13,0,15,7FFF,WRL300,C55E083892F5,1,,,,,,,,,,,,,,,,,0,1,0.0,326,117.6,113.947932,22.573556,20230727035107,0460,0001,253E,06F75801,,,20230727035105,0C7F$

Parameter	Length (Byte)	Range/Format	Default
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z','0' – '9'}	
Unique ID	15	(IMEI)	
Device Name	<=20	'0' - '9', 'a' - 'z', 'A' - 'Z', '-', '_'	
Index	<=2	(HEX)(0 - 9|FF)	

Accessory Type	<=2	0|3|6|13	
Accessory Model / Beacon ID Model	1	0 - 5	
Alarm Type	2	00 - FF	
Accessory Append Mask	4	0000 - FFFF	
Accessory Name (Optional)	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' ' ' '_'	
Accessory MAC (Optional)	12	'0' – '9' 'A' – 'F'	
Accessory Status (Optional)	1	0|1	
Accessory Battery Level (Optional)	<=4	0 - 5000(mV)	
Accessory Temperature (Optional)	<=3	-40 - 80(℃)	
Accessory Humidity (Optional)	<=3	0 - 100%(rh)	
Reserved1 (Optional)	0		
Reserved2 (Optional)	0		
Reserved3 (Optional)	0		
Reserved4 (Optional)	0		
Reserved5 (Optional)	0		
Reserved6 (Optional)	0		
Reserved7 (Optional)	0		
Reserved8 (Optional)	0		
Accessory Battery Percentage (Optional)	<=3	0 – 100%	
Relay Config Result (Optional)	1	0-4	
Relay state (Optional)	1	0-1	
GNSS Accuracy	1	0	
Speed	<=5	0.0 - 999.9(km/h)	
Azimuth	<=3	0 - 359	
Altitude	<=8	(-)XXXXX.X(m)	
Longitude	<=11	-180 - 180	

Latitude	<=10	-90 - 90	
GNSS UTC Time	14	YYYYMMDDHHMMSS	
MCC	4	0XXX	
MNC	4	0XXX	
LAC	4	(HEX)	
Cell ID	0|4|8	(HEX)	
Reserved	0		
Reserved	0		
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

✧ <*Index*>: The Index of the Bluetooth accessory.

- The index of Bluetooth accessory defined in **AT+GTBAS** which triggers the **+RESP:GTBAA** message.

For WKF300, it is 0xFF. For other Beacon, it is 0xFE.

✧ <*Accessory Type*>: The type of the Bluetooth accessory which is defined in the <*Index*>.

- 0: No Bluetooth accessory
- 3: Bluetooth beacon accessory
- 6: Multi-Functional beacon sensor
- 13: Relay Sensor

✧ <*Accessory Model / Beacon ID Model*>: The model of the Bluetooth accessory which is defined in **AT+GTBAS** or the model of the Bluetooth Beacon accessory which is defined in **AT+GTBID.**

✧ <*Alarm Type*>: The type of alarm which is generated by the Bluetooth accessory specified by <*Accessory Type*> and <*Accessory Model*> in the **AT+GTBAS** command.

- 0: The voltage of the Bluetooth accessory is low.
- 1: Temperature alarm: The current temperature value is below <*Low Temperature*> set in the **AT+GTBAS** command.
- 2: Temperature alarm: The current temperature value is above <*High Te*mperature> set in the **AT+GTBAS** command.
- 3: The temperature alarm: The current temperature value is within the range defined by <*Low Temperature*> and <*High Temperature*> set in the **AT+GTBAS** command.
- 4: Pushbutton event for WKF300 is detected.
- 7: Humidity alarm: The current humidity value is below <*Low Humidity*> set in the **AT+GTBAS** command.
- 8: Humidity alarm: The current humidity value is above <*High Humidity*> set in the **AT+GTBAS** command.

- 9: Humidity alarm: The current temperature value is within the range defined by <*Low Humidity*> and <*High Humidity*> set in the **AT+GTBAS** command.
- 13: Door open
- 14: Door closed
- 15: Relay event notification

✧ <*Accessory Append Mask*>: Bitwise mask defined in **AT+GTBAS** or **AT+GTBID** command to indicate the reported Bluetooth accessory data fields.

- Bit 0: <*Accessory Name*>
- Bit 1: <*Accessory MAC*>
- Bit 2: <*Accessory Status*>
- Bit 3: <*Accessory Battery Level*>
- Bit 4: <*Accessory Temperature*>
- Bit 5: <*Accessory Humidity*>
- Bit 8: Reserved
- Bit 10: Reserved
- Bit 13: <*Accessory Battery Percentage*>
- Bit 14: <*Relay Data*>

✧ <*Accessory Name*>: The Bluetooth accessory name. If the accessory name is not found, this field will be empty.

✧ <*Accessory MAC*>: Bluetooth accessory MAC address.

✧ <Accessory Status>: A numeral to indicate whether the accessory is available.

- 0: The accessory is not available.
- 1: The accessory is available.

✧ <*Accessory Battery Level*>: The battery voltage of the Bluetooth accessory.

✧ <*Accessory Temperature*>: Temperature data of Bluetooth accessory.

✧ <*Accessory Humidity*>: Humidity data of the Bluetooth accessory.

✧ <*Accessory Battery Percentage*>: Percentage of Bluetooth accessory's battery power.

✧ <*Relay state*>: The current state of the WRL300 sensor. 1 means relay opened.

✧ <*Relay Config Result*>: The number representing the response result of the relay, which is controlled and reported by Bit14 of the **AT+GTBAS** parameter <*Accessory Append Mask*>.

- 0: Configuration updated successfully.
- 1: Error in connecting.
- 2: The current password is incorrect.
- 3: Password update error.
- 4: Relay open or close error.

✧ <Reserved1 ~ 2>: It is controlled and reported by Bit8 of the <*Accessory Append Mask*>.

✧ <Reserved3 ~ 5>: It is controlled and reported by Bit9~11 of the <*Accessory Append Mask*>.

✧ <Reserved6 ~ 8>: It is controlled and reported by Bit12 of the <*Accessory Append Mask*>.

The event report message **+RESP:GTBID** uses the format below.

Example:

+RESP:GTBID,BD0209,864281043116186,CV200,2,0,00CA,7805412CCC4C,3058,-54,,,0,00CA,7805412CCC4C,3059,-52,,,1,0.0,339,114.5,113.947930,22.573545,20230725112736,0460,0001,253E,06F75801,,,20230725112737,07EB$

Parameter	Length (Byte)	Range/Format	Default
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z','0' – '9'}	
Unique ID	15	(IMEI)	
Device Name	<=20	'0' - '9', 'a' - 'z', 'A' - 'Z', '-', '_'	
Number	1	0 – 3	
Beacon ID Model	1	0	
Accessory Append Mask	4	(HEX)	
Accessory MAC (Optional)	12	(HEX)	
Accessory Battery Level (Optional)	<=4	0 – 5000(mV)	
Accessory Signal Strength (Optional)	<=4	-120 – 0	
Reserved1 (Optional)	0		
Reserved2 (Optional)	0		
GNSS Accuracy	1	0	
Speed	<=5	0.0 – 999.9(km/h)	
Azimuth	<=3	0 – 359	
Altitude	<=8	(-)XXXXX.X(m)	
Longitude	<=11	-180 - 180	
Latitude	<=10	-90 - 90	
GNSS UTC Time	14	YYYYMMDDHHMMSS	
MCC	4	0XXX	
MNC	4	0XXX	
LAC	4	(HEX)	
Cell ID	0|4|8	(HEX)	
Reserved	0		
Reserved	0		
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

- <*Number*>: The number of the Bluetooth beacon accessories**.**
  - WKF300. The maximum value is 3.
- <*Beacon ID Model*>: The model of the Bluetooth beacon ID accessory which is defined in **AT+GTBID.**
- <*Accessory Append Mask*>: Bitwise mask defined in the **AT+GTBID** command to indicate the reported Bluetooth beacon accessory data fields.
  - Bit 0: Reserved
  - Bit 1: <*Accessory Mac*>
  - Bit 2: Reserved
  - Bit 3: <*Accessory Battery Level*>
  - Bit 4: Reserved
  - Bit 5: Reserved
  - Bit 6: <*Accessory Signal Strength*>
  - Bit 7: Reserved
- <*Accessory MAC*>: The MAC address of the Bluetooth beacon accessory.
- <*Accessory Battery Level*>: The battery voltage of the Bluetooth beacon accessory.
- <*Accessory Signal Strength*>: The signal strength of Bluetooth accessory.
- <Reserved1 ~ 2>: It is controlled and reported by Bit7 of the <*Accessory Append Mask*>.

2.3.5.Buffer Report

If the buffer report function is enabled by the command **AT+GTSRI**, the terminal will save the report messages in a local buffer when the following occurs.

- Network is not available.
- Network context activation for the TCP or UDP connection fails.
- Establishment of the TCP connection with the backend server fails.

The buffered messages will be sent to the backend server when the connection to the server is recovered. The buffered messages are saved to the built-in non-volatile memory in case the device is reset. The terminal can buffer up to 10,000 messages.

Detailed information about buffer report is given below.

- Only **+RESP** messages except **+RESP:GTPDP**, **+RESP:GTALM** and **+RESP:GTALC** are buffered.
- In the buffer report, the original header string "**+RESP**" is replaced by "**+BUFF**" while the other content including the original sending time and count number is kept unchanged.
- Buffered messages will be sent only via network by TCP or UDP protocol.
- The buffered messages will be sent after real-time messages if <*Buffer Mode*> in **AT+GTSRI** is set to 1.
- The buffered messages will be sent before real-time messages if <*Buffer Mode*> in **AT+GTSRI** is set to 2. The **+RESP:GTSOS** report has the highest priority and is sent before the buffered reports.

Example:

The following is an example of the buffered message:

+BUFF:GTFRI,450101,868034001000579,CV200,0,10,1,1,0.4,60,56.6,117.201309,31.833082,20130107182151,0460,0000,5678,2079,00,21188.6,,,,100,210100,,,,20130107182154,01B8$

2.3.6.Transparent Data Transmission

The device supports transparent data transfer between the backend server and the peripheral device connected to its second serial port. The device supports bi-directional data transmission. In both directions, the data is transparent to the device.

a) Transfer data from the peripheral device to the backend server

According to <*Working Mode*> of the command **AT+GTURT**, there are two ways for the peripheral device to communicate with the device.

If the peripheral device supports the **AT+GTDAT** command, it can transfer data via this command. The peripheral device can send the command **AT+GTDAT** with the data to the serial port. According to <*Command Type*> of **AT+GTDAT**, the device wraps the corresponding data into the backend server with the **+RESP:GTDAT** message either in short format or in long format.

b) Transfer data from the backend server to the peripheral device

If the backend server needs to send data to the peripheral device, it can send the command **AT+GTDAT** with the data to the device and the device will pick out the pure data and send it to the second serial port. The peripheral device can thus get the data from the serial port.

Data to the Backend Server

- **+RESP:GTDAT (Short Format),**

Example: **+RESP:GTDAT,BD0210,864281043116186,CV200,data,20230827191939,018B$**			
Parameter	**Length (Byte)**	**Range/Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z','0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Data to the Backend Server	<=1280	ASCII Code	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

- **+RESP:GTDAT (Long Format),**

Example: **+RESP:GTDAT,BD0210,864281043116186,CV200,1,,,data,1,0.0,28,116.8,113.947984,22.573575,20230828032118,0460,0001,253E,06F75801,,,,,,,20230827192119,0192$**

Parameter	Length (Byte)	Range/Format	Default
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z','0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Report Type	1	0|1	
Reserved	0		
Reserved	0		
Data to the Backend Server	<=1280	ASCII Code	
GNSS Accuracy	<=2	0	
Speed	<=5	0.0 – 999.9 km/h	
Azimuth	<=3	0 – 359	
Altitude	<=8	(–)xxxxx.x m	
Longitude	<=11	(–)xxx.xxxxxx	
Latitude	<=10	(–)xx.xxxxxx	
GNSS UTC Time	14	YYYYMMDDHHMMSS	
MCC	4	0XXX	
MNC	4	0XXX	
LAC	4	XXXX	
Cell ID	0|4|8	XXXX/XXXXXXXX	
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

✧ <*Report Type*>: It indicates where the data comes from.

- 0: Reserved.
- 1: **AT+GTDAT** from serial port.

Data to the second serial port starts with a new line and is terminated with '\r\n'.

Example: **data to the serial port**

2.3.7.Report with Google Maps Hyperlink

If <*Location by Call*> in the command **AT+GTCFG** is set to 2 or 3, the device will send its current location to the call number of incoming call via SMS with a Google Maps hyperlink.

➢ **Google Maps Hyperlink**

Example: **cv200:** **http://maps.google.com/maps?q=22.53727833,114.01535833** **F1 D2021/06/05T09:39:49 B82 I1 S0.0**			
Parameter	**Length (Byte)**	**Range/Format**	**Default**
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Google Maps Hyperlink Header	30	http://maps.google.com/maps?q=	
Latitude	<=10	-90 - 90	
Longitude	<=11	-180 - 180	
GNSS Fix	<=3	F0|F1 – F50	
GNSS UTC Time	20	DYYYY/MM/DDTHH:MM:SS	
Battery Percent	<=4	B0-B100	
Ignition State	<=2	I0-I1	
Speed	<=6	S0.0-S999.9 km/h	

✧ <*GNSS Fix*>: The accuracy of the location information. F0 means "No GNSS fix". A non-zero value (1 - 50) means the current GNSS fix is successful and represents the HDOP of the current GNSS position.

✧ <*Ignition Status*>: The current ignition state (on/off) of the device.

- 0: The device is currently ignition off.
- 1: The device is currently ignition on.

2.3.8.Crash Data Packet

The message contains 15s tri-axial acceleration data before and after crash at most. When crash accident is detected, tri-axial acceleration data before crash will be reported to backend server in several frames. And the device will continue to record tri-axial data after crash and report the data to backend server in several frames.

➢ **+RESP:GTCRD,**

Example:
+RESP:GTCRD,BD0101,864292043419363,CV200,01,80,10,1,FF850055F84CFFFB0002FFFAFF8C0054F847FFFB0003FFFBFF8A0056F849FFFA0003FFFBFF890052F845FFF90001FFFBFF870052F84AFFFA0003FFFBFF85004FF848FFFB0002FFFAFF8C0055F84EFFFC0002FFF9FF870054F847FFFB0002FFFAFF8B0056F845FFFB0001FFFBFF870058F84AFFFB0003FFFAFF900053F84AFFFB0001FFFAFF8B0055F844FFFB0001FFFAFF86004EF844FFFB0001FFFBFF8C004EF84AFFFA0003FFF9FF8D004EF847FFF90002FFF9FF850054F849FFF90001FFF9FF8A0051F848FFFA0003FFFAFF880051F848FFFA0002FFFAFF8C0054F847FFFD0000FFFBFF8C004FF843FFFB0004FFFAFF840051F845FFFB0002FFFAFF890055F84CFFFA0002FFFAFF860052F845FFFB0000FFFBFF86004FF84BFFFB0001FFFAFF870051F846FFFA0002FFFAFF8B005AF846FFFB0003FFFBFF860058F84AFFFB0002FFF9FF860053F849FFFA0001FFFAFF87004EF846FFFA0002FFFAFF8A0053F84EFFFB0002FFFAFF890055F849FFFA0003FFFAFF880052F848FFFA0002FFFAFF890051F849FFFB0003FFFBFF90004FF84AFFFB0002FFFAFF880051F845FFFA0002FFFAFF880056F848FFFC0001FFFAFF870050F849FFFB0004FFFAFF900055F844FFFA0002FFFAFF8A0053F84DFFFC0001FFFAFF830052F84CFFFA0001FFFBFF84004FF848FFFA0002FFFAFF8C0050F84BFFFA0003FFFAFF880055F847FFFA0002FFFCFF910049F848FFFD0003FFFAFF88004FF848FFFA0003FFFAFF8E0056F846FFF80003FFFBFF8A004FF844FFFB0002FFFAFF8D0050F847FFFB0002FFFAFF880053F847FFFA0002FFFAFF870053F847FFF90002FFFB,20200527120102,024B$

Parameter	Length (Byte)	Range/Format	Default
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z','0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z'	
Crash Counter	=2	00-FF	
Data Type	2	00-FF	
Total Frame	<=2	1-64	
Frame Number	<=2	1-64	
Data	<=1200	'0'-'9' 'A'-'F'	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

- <*Crash Counter*>: A hexadecimal value to indicate the sequence number of the crash event which combines the reports of **+RESP:GTCRA** and **+RESP:GTCRD** into one crash event. It rolls from 00 to FF.
- <*Data Type*>: A hexadecimal value to indicate the time of the data (recorded before crash or after crash) and crash direction (+X, -X, +Y, -Y, +Z, -Z or several of them). Please refer to the following table for details.

Bits	Description		Range
Bit 0	0: Before crash	1: After crash	0-1
Bit 7	0: Acceleration data	1: Acceleration data and gyroscope data	0-1

- <*Total Frame*>: The total number of messages that are sent to the backend server for the crash event.
- <*Frame Number*>: A numeral to indicate the sequence of the current message.
- <*Data*>: If Bit 7 of <*Data Type*> is 0: There are maximum 1200 ASCII characters (with 12 characters in a group) in one message which contains acceleration samples within at most 1 second. The first 4 characters of these 12 characters represent X-axis acceleration data, the middle 4 characters represent Y-axis acceleration data and the last 4 characters represent Z-axis acceleration data. The ASCII "0001" is equal to 0x0001 in hex format, and the ASCII "afff" is equal to 0xAFFF in hex format. And they are two's complement.

  If Bit 7 of <*Data Type*> is 1: There are maximum 1200 ASCII characters (with 24 characters in a group) in one message which contains acceleration samples within at most 1 second. The first 4 characters of these 24 characters represent X-axis acceleration data, the characters from 5 to 8 represent Y-axis acceleration data, the characters from 9 to 12 represent Z-axis acceleration data, the characters from 13 to 16 represent X axis gyroscope data, the characters from 17 to 20 represent Y axis gyroscope data and the characters from 21 to 24 represent Z axis gyroscope data. The ASCII "0001" is equal to 0x0001 in hex format, and the ASCII "afff" is equal to 0xAFFF in hex format. And they are two's complement.

Example:

+RESP:GTCRD,BD0101,864292043419363,CV200,01,80,10,1,FF850055F84C...,20200527120102,024B$

This is the XYZ-axis acceleration data:

Conversion to hex format: X (axis acceleration data) = 0xFF85; Y = 0x0055; Z = 0xF84C;

Decimal format: X (axis acceleration data) = -123; Y = 85; Z = -1972;

+RESP:GTCRD,BD0101,864292043419363,CV200,01,80,10,1,FF850055F84CFFFB0002FFFA...,20200527120102,024B$

This is the XYZ-axis acceleration and gyroscope data:

Conversion to hex format: X (axis acceleration data) = 0xFF85; Y = 0x0055; Z = 0xF84C;

Conversion to hex format: X (axis gyroscope data) = 0xFFFB; Y = 0x0002; Z = 0xFFFA;

Decimal format: X (axis acceleration data) = -123; Y = 85; Z = -1972;

Decimal format: X (axis gyroscope data) = -5; Y = 2; Z = -6;

Note: Acceleration of gravity (+g) is 2048 in decimal format and –g is -2048. The linearized acceleration data 32767 represents +4g and -32768 represents -4g.

2.3.9.Data Report

The following report is triggered when certain data needs to be sent.

+RESP:GTPGR: The message contains GNSS data before crash and after crash and it is triggered by crash incident.

- **+RESP:GTPGR,**

Example:

+RESP:GTPGR,BD0101,864292043419363,CV200,1,01,0,2,1,20,,1,1,0.0,0,123.8,114.015487,22.537203,20200527040029,2,1,0.0,0,123.8,114.015487,22.537203,20200527040030,3,1,0.0,0,123.8,114.015487,22.537203,20200527040031,4,1,0.0,0,123.8,114.015487,22.537203,20200527040032,5,1,0.0,0,123.8,114.015487,22.537203,20200527040033,6,1,0.0,0,123.8,114.015487,22.537203,20200527040034,7,1,0.0,0,123.8,114.015487,22.537203,20200527040035,8,1,0.0,0,123.8,114.015487,22.537203,20200527040036,9,1,0.0,0,123.8,114.015487,22.537203,20200527040037,10,1,0.0,0,123.8,114.015487,22.537203,20200527040038,11,1,0.0,0,123.8,114.015487,22.537203,20200527040039,12,1,0.0,0,123.8,114.015487,22.537203,20200527040040,13,1,0.0,0,123.8,114.015487,22.537203,20200527040041,14,1,0.0,0,123.8,114.015487,22.537203,20200527040042,15,1,0.0,0,123.8,114.015487,22.537203,20200527040043,16,1,0.0,0,123.8,114.015487,22.537203,20200527040044,17,1,0.0,0,123.8,114.015487,22.537203,20200527040045,18,1,0.0,0,123.8,114.015487,22.537203,20200527040046,19,1,0.0,0,123.8,114.015487,22.537203,20200527040047,20,1,0.0,0,123.8,114.015487,22.537203,20200527040048,20200527120103,0251$

Parameter	Length (Byte)	Range/Format	Default
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z','0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z'	
Trigger Type	1	1	
Crash Counter	<=3	00-FF	
Data Type	1	0 | 1	
Total Frame	2	1 – 6	
Frame Number	2	1 – 6	
GNSS Validity Number	2	0 – 20	
Reserved	0		
GNSS Point Index	<=2	1	
GNSS Accuracy	<=2	0|1 – 50	
Speed	<=5	0.0 – 999.9 km/h	

Azimuth	<=3	0 – 359	
Altitude	<=8	(–)xxxxx.x m	
Longitude	<=11	(–)xxx.xxxxxx	
Latitude	<=10	(–)xx.xxxxxx	
GNSS UTC Time	14	YYYYMMDDHHMMSS	
…			
GNSS Point Index	<=2	20	
GNSS Accuracy	<=2	0|1 – 50	
Speed	<=5	0.0 – 999.9 km/h	
Azimuth	<=3	0 – 359	
Altitude	<=8	(–)xxxxx.x m	
Longitude	<=11	(–)xxx.xxxxxx	
Latitude	<=10	(–)xx.xxxxxx	
GNSS UTC Time	14	YYYYMMDDHHMMSS	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

- <*Trigger Type*>: It indicates which incident triggers the report message.
  - 1: Crash incident.
- <*Total Frame*>: The total number of **+RESP:GTPGR** messages that are sent to the backend server for the crash event.
- <*Frame Number*>: A numeral to indicate the sequence of the current message.
- <*Crash Counter*>: A value to indicate the crash sequence. The three report messages **+RESP:GTCRA**, **+RESP:GTCRD** and **+RESP:GTPGR** are combined into one crash event. It rolls from 0x00 to 0xFF.
- <*Data Type*>: It indicates whether the data reported to the backend server is recorded before crash or after crash.
  - 0: Before crash.
  - 1: After crash.
- <*GNSS Validity Number*>: The number of the successfully fixed GNSS positions included in the report message.
- <*GNSS Point Index*>: The index of GNSS point.

2.4. Heartbeat

Heartbeat is used to maintain the contact between the device and the backend server in case of network communication. The heartbeat package is sent to the backend server at the interval

defined by <*Heartbeat Interval*> in the **AT+GTSRI** command.

➢ **+ACK:GTHBD,**

Example: **+ACK:GTHBD,BD0200,868487004353181,cv200,20210608163541,33D0$**			
Parameter	**Length (Byte)**	**Range/Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z','0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

Whenever the backend server receives a heartbeat package, it should reply with an acknowledgement to the device.

➢ **+SACK:GTHBD,**

Example: **+SACK:GTHBD,BD0101,11F0$** **+SACK:GTHBD,,11F0$**			
Parameter	**Length (Byte)**	**Range/Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z','0' – '9'}	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

✧ <*Protocol Version*>: The device type and the protocol version that the backend server supports. This field is optional. The backend server could just send an empty field to decrease the length of the heartbeat data acknowledgement.

✧ <*Count Number*>: The backend server uses the <*Count Number*> extracted from the heartbeat package from the device as the <*Count Number*> in the server acknowledgement of the heartbeat.

2.5. Server Acknowledgement

If server acknowledgement is enabled by the **AT+GTSRI** command, the backend server should reply to the device whenever it receives a message from the device.

➢ **+SACK:**

Example: **+SACK:11F0$**			
Parameter	**Length (Byte)**	**Range/Format**	**Default**
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

✧ <*Count Number*>: The backend server uses the <*Count Number*> extracted from the received message as the <*Count Number*> in the server acknowledgement.

Appendix A: Message Index

- **Command and ACK**

AT+GTOUT
+ACK:GTOUT
AT+GTOPB
+ACK:GTOPB
AT+GTREC
+ACK:GTREC
AT+GTOSD
+ACK:GTOSD
AT+GTFTP
+ACK:GTFTP
AT+GTSSA
+ACK:GTSSA
AT+GTBTS
+ACK:GTBTS
AT+GTBAS
+ACK:GTBAS
AT+GTBID
+ACK:GTBID
AT+GTURT
+ACK:GTURT
AT+GTDAT
+ACK:GTDAT
AT+GTRTO
+ACK:GTRTO
AT+GTHMC
+ACK:GTHMC
AT+GTWLT
+ACK:GTWLT
AT+GTUPC
+ACK:GTUPC
AT+GTDSS
+ACK:GTDSS

✧ **Position Related Report**

+RESP:GTRTL
+RESP:GTDOG
+RESP:GTDIS
+RESP:GTIGL
+RESP:GTHBM
+RESP:GTFRI
+RESP:GTLBC
+RESP:GTSOS
+RESP:GTBTN

- **Device Information Report**

  +RESP:GTOSI

- **Report for Querying**

  +RESP:GTGPS
  +RESP:GTALM
  +RESP:GTALC
  +RESP:GTALS
  +RESP:GTCID
  +RESP:GTCSQ
  +RESP:GTVER
  +RESP:GTBAT
  +RESP:GTTMZ
  +RESP:GTAIF
  +RESP:GTGSV
  +RESP:GTSCS

- **Event Report**

  +RESP:GTPNA
  +RESP:GTPFA
  +RESP:GTPDP
  +RESP:GTMPN
  +RESP:GTMPF
  +RESP:GTBTC
  +RESP:GTSTC
  +RESP:GTBPL
  +RESP:GTSTT
  +RESP:GTIGN
  +RESP:GTIGF
  +RESP:GTIDN
  +RESP:GTSTR
  +RESP:GTSTP
  +RESP:GTLSP
  +RESP:GTIDF
  +RESP:GTGSM
  +RESP:GTGSS
  +RESP:GTCRA
  +RESP:GTUPC
  +RESP:GTEUC
  +RESP:GTASC
  +RESP:GTOSP
  +RESP:GTODP
  +RESP:GTDSS
  +RESP:GTDAR

- **Crash Data Packet**
  +RESP:GTCRD
  +RESP:GTPGR

- **Transparent Data Transmission**
  +RESP:GTDAT (Short Format)
  +RESP:GTDAT (Long Format)

- **Heartbeat**
  +ACK:GTHBD
  +SACK:GTHBD

- **Server Acknowledgement**
  +SACK

Appendix B: Event Code – Recording Type

Event Code	Recording Type
00	Normal Record
01	Ignition ON
02	Ignition OFF
03	Power Disconnected
04	Crash Detection
05	Harsh Acceleration
06	Harsh Braking
07	Harsh Turning
08	Over Speed Alarm
09	Panic Button Clicking (Panic Event)
0A	Panic Button Hold On (SOS Alarm)
0E	GEO-PEO-Fence
0F	Parking Safeguard
F0	Manual Record
F1	SOD Time Range Record File
D1	Eyes Close Detection
D2	Yawning Detection
D3	Distraction Detection
D4	Smoking Detection
D5	Phone Use Detection
D6	Driver Abnormal Detection.
D7	IR Blocking Detection.

Appendix C: Accessory Index

Accessory Model Name	Accessory Type	Accessory Model	Alarm Type	Append Mask
DTH100 (WMS301)	6	4	0 – 3|7 – 9|13 – 14	203F
WRL300	13	0	15	4007