CV200 @Track Air Interface Protocol

Telematics Dual-Lens LTE CAT6 DASH CAM

QSZTRACCV200AN0218

Version: 2.18

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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.
2.11	2023-10-16	Gino Li	1. Added parameter “Serial Number” to +RESP:GTVDO, +RESP:GTPIC, +RESP:GTRFQ, and +RESP:GTSOD.

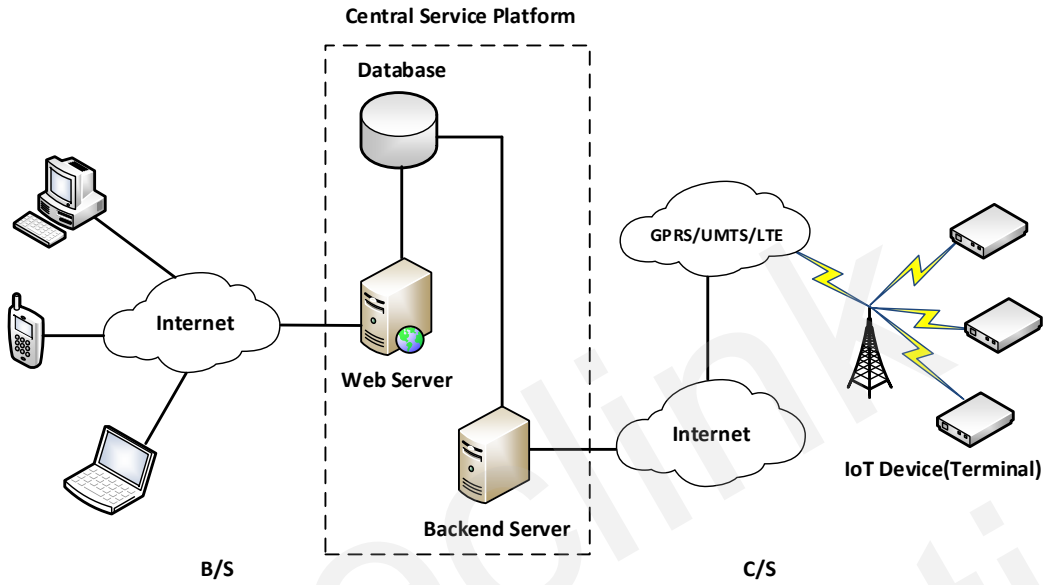
			2. Modified AT+GTOSD, to support “daylight saving start time“, “daylight saving end time”. 3. Deleted AT+GTTMA parameters “Sign”, “Hour Offset”, “Minute Offset”, “Daylight Saving” and “UTC Time”, just kept “NTP Address”. 4. Added parameter “RTO Serial Number” to AT+GTCFG. 5. In AT+GTBID, modified <*Push Button Event*> parameter. 6. Added parameters “Detect Virtual Ignition On Duration” and “Detect Virtual Ignition Off Duration” to AT+GTVMS. 7. Added AT+GTNMD for Non-Movement Detection.
2.12	2023-11-14	Daniel Yang	1. Added <Accessory Type> 4/12 in AT+GTBAS, added <Accessory Append Mask> bit9/10. 2. Extended <TTS Alerts Mask> in AT+GTVOL. 3. In AT+GTDSS, added <Event ID> 8|20-22, Reserved <Trigger Duration>, and added parameter “Sensitivity Level”. 4. In AT+GTREC, modified parameter “Picture Event Mask" and “Picture Upload Mask” and “Video Event Mask" and “Video Upload Mask”. 5. Added RTO-CCP and CAP/CAN/CVN/CSN/COP/CQM sub command to AT+GTRTO. And extended <Module Type>. 6. In AT+GTFRI, added <ERI Mask> bit2. 7. Added <Working Mode> 12 in AT+GTURT. 8. Added AT+GTCAN, AT+GTCLT, AT+GTCFU. 9. Added <UART Device Type>, <CAN Data (Optional)> in +RESP:GTERI. 10. Added +RESP:GTCSN/CVN/CML/CIF/CLT/CAN/CFU. 11. Added <Pushing Audio> <Pushing Timeout> <Frame Number> in AT+GTRTO (SOD) 12. Added <Picture Time> in AT+GTRTO(PIC) 13. Added Option “3: Delete uploading log file task” to AT+GTRTO(PSL) 14. Added “Appendix D: File Name Definition”.
2.13	2024-01-22	Daniel Yang Gino Li	1. Added AT+GTFFC, AT+GTRMD command. 2. Added +RESP:GTRMD. 3. Modified <*Report ID/Report Type*> in +RESP:GTFRI. 4. Added <Camera Flip> in AT+GTREC. 5. Added <Manual Netreg> field into AT+GTBSI. 6. Added AT+GTNTS command.

			7. Added <Earliest Recording Time> in +RESP:GTOSI. 8. Added “3: SFTP” option in AT+GTFSO.
2.14	2024-02-19	Gino Li Daniel Yang	1. Added AT+GTSVR command. 2. Added +RESP:GTBTI and +RESP:GTSVR. 3. Added option “9: Used for camera” in AT+GTURT <Working Mode>. 4. Added AT+GTCMS, AT+GTTAP command. 5. Added +RESP:GTPHD and +RESP:GTPHL. 6. Moved +RESP:GTHBM/+RESP:GTSOS/+RESP:GTBTN from “Position Related Report” to “Event Report”.
2.15	2024-03-20	Daniel Yang Gino Li	1. Added option “8: Portuguese” in AT+GTVOL < Voice Option>. 2. Added <Forced Event Audio Mask> in AT+GTREC. 3. Extended <Event Recording Time> in AT+GTREC. 4. Added report type 4\5\6 in +RESP:GTDOG. 5. Added option “2: Cigar Lighter Power Mode” in AT+GTVMS <Virtual Ignition Mode>. 6. Modified the description of option 0|1 in AT+GTVMS <Virtual Ignition Mode>.
2.16	2024-04-01	Daniel Yang Shelton Wang Gino Li	1. Added <Protected Video> in AT+GTRTO (RFQ). 2. Added option “Show time offset” in AT+GTOSD <Display Mask>. 3. Remove “0: Disable the power saving function” in AT+GTCFG <Power Saving Mode>. 4. Modified <Code Status> 1X3 2X2 in +RESP:GTSOD. 5. Added <Code Status> 1X9, 1XA, 1XB, 1XC, 2X5, 2X6, 2X7, 3X1 in +RESP:GTSOD. 6. Added <Upload State> 3: FTP/AWS upload suspend in +RESP:GTFTP, added <Code Status> 2x2: Upload picture suspends in +RESP:GTPIC, and added <Code Status> 3x3: Such as 303 or 313. The device suspends to upload file in +RESP:GTVDO. 7. Reserved <Event Recording Time> and added <Event Recording Duration> in AT+GTREC. 8. Added parameter <Electric Report Mask> to the command **AT+GTCAN**. 9. Modified <Trigger Speed> and <Silent Duration> in AT+GTDSS. 10. Removed “0: Start acceleration sampling after the device is powered on” in AT+GTCRA <Sampling Start>. 11. Modified <Crash Threshold>, <High Shock Sensitivity> in AT+GTCRA, the upper range is changed

			to 160. 12. Removed “112” code status in +RESP:GTPIC <*Code Status*>. 13. Add “2: km/h” in AT+GTOSD <GPS Speed Measurement>. 14. Extended <Camera Flip> in AT+GTREC. 15. Modified the description of +RESP:GTTMZ.
2.17	2024-08-06	Daniel Yang Shelton Wang Gino Li	1. Added parameter <AWS End Point URL> and <Path Format> to the command **AT+GTFSO**. 2. Added parameter <Escort Bluetooth> to the command **AT+GTBAS**. 3. Modified the range of <Recording Time After Ignition Off> of **AT+GTREC** to 0.5 ~ 5.0 minutes. 4. Added **+RESP:GTWFS**; Added <Event Mask> bit9 in **AT+GTCFG** and **AT+GTRMD**. 5. Added parameter <Duration> to the command RTO-VDO; Added new option “2: Video duration request” to RTO-VDO <Query Type>. 6. Added Option “16” to AT+GTRTO(WFS). 7. Added <Report ACC Mode> in AT+GTCRA; Added +RESP:GTACC. 8. Added option “5: Standard Beacon” in AT+GTBID <Beacon ID Model>. 9. Added <Organization Unique Identifier> and <Message Type> in AT+GTBID. 10. Added +RESP:GTBIE. 11. Added <Report Mode> in AT+GTHBM; Added +RESP:GTHBE. 12. Added <High Speed> <Medium Speed> in AT+GTHBM. 13. Added option “7: Italian” in AT+GTVOL <Voice Option>.
2.18	2024-09-26	Daniel Yang Gino Li	1. Added option “1: CAN100 STD_THR in **AT+GTURT** <Working Mode>. 2. Extended <Additional Event Mask> in **AT+GTCAN**. 3. Added <Tacho Report Mask>/<Tacho Report Interval>/<CAN Report Expansion Mask1>/<Tachograph Driver1 Working Time Mask>/<Tachograph Driver2 Working Time Mask> in **AT+GTCAN**. 4. Added <CAN Report Mask> bit23~27 in **AT+GTCAN**.

			5. Added <CAN Report Expansion Mask> bit24~31 in **AT+GTCAN**. 6. Added <Electric Report Mask> bit0~2 and bit7~8 and bit10~14 in **AT+GTCAN**. 7. Added <CAN Data Mask> bit23~27 in **AT+GTCLT**. 8. Added <CAN Report Expansion Mask> bit24/25/28 in **AT+GTCLT**. 9. Added **AT+GTTTR** command. Added **+RESP:GTTTR/+RESP:GTTRL/+RESP:GTTRD**. 10. Added **+RESP:GTACN**. 11. Added **AT+GTTLS/AT+GTRTP/AT+GTLTP**. 12. Added **AT+GTVVS** command. 13. Added <Ring Alerts Mask> in **AT+GTVOL** command. 14. Changed “Front camera” to “Channel 1”, changed “Interior camera” to “Channel 2” 15. Added <Event Mask> bit16 in **AT+GTCFG** and **AT+GTRMD**. 16. Added <Position Append Mask> in **AT+GTCFG** command. 17. Added <Button Pressed> bit1 in **AT+GTVOL**. 18. Modified the range of <Detect Virtual Ignition On Duration> in AT+GTVMS to 5 ~ 60s. 19. Added description to AT+GTWFS, 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>,…<serial number>$	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'.

The <serial number> increments each time a new command is issued. If the value exceeds FFFF, the next increment starts from 0000.

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:

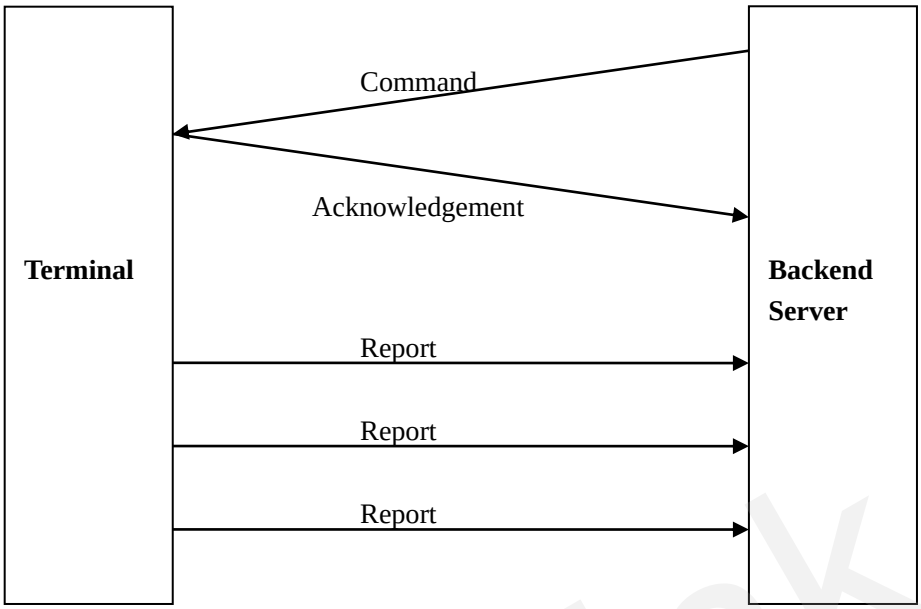


Figure 1: @Track Protocol Message Flow

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	Manual Netreg	1	0 – 1	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
- <Manual Netreg>: Manual network registration selection.
  - 0: Disable manually register the network.
  - 1: Enable manually register the network.
- <*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/	<=60		

	Domain Name			
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.

2.2.1.3. Network Selection

The **AT+GTNTS** command is used to set network selection when the signal is weak.

➢ **AT+ GTNTS=**

Example: **AT+GTNTS=cv200,0,,,,,,,,,,FFFF$**				
SN	**Parameter**	**Length (Byte)**	**Range/Format**	**Default**
1	Password	4 - 20	'0' – '9' 'a' – 'z' 'A' – 'Z'	cv200
2	Enable	1	0|1	0
3	Reserved	0		
4	Reserved	0		
5	Allowed Oper1	10		
6	Allowed Oper2	10		
7	Allowed Oper3	10		
8	Reserved	0		
9	Blocked Oper1	10		
10	Blocked Oper2	10		
11	Blocked Oper3	10		
12	Reserved	0		
	Serial number	4	0000 – FFFF	
	Tail character	1	$	$

✧ <*Enable*>: Enable or disable “NTS” based functionality.

- 0: Disable
- 1: Enable

✧ <*Allowed Oper1*>: The first network to select.

✧ <*Allowed Oper2*>: The second network to select.

✧ <*Allowed Oper3*>: The third network to select.

✧ <*Blocked Oper1*>: The network that is refused to be selected.

✧ <*Blocked Oper2*>: The network that is refused to be selected.

✧ <*Blocked Oper3*>: The network that is refused to be selected.

Note: To enable this function, enable <Manual Netreg> in AT+GTBSI first. The operator info in <Allowed Oper> must be different from <Blocked Oper>.

The acknowledgment message of AT+ GTNTS command:

➢ **+ACK:GTNTS,**

Example: **+ACK:GTNTS,BD0213,862170019025640,,0002,20140511093254,11F0$**			
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	$	$

2.2.1.4. TLS Data Encryption

The command **AT+GTTLS** is used to configure TLS encryption parameters.

➢ **AT+GTTLS=**

Example:
AT+GTTLS=cv200,0,1,1,,,FFFF$

SN	Parameter	Length (Byte)	Range/Format	Default
1	Password	4 – 20	'0' – '9' 'a' – 'z' 'A' – 'Z'	cv200
2	Server ID	1	0	0
3	Mode	1	0|1	0
4	Certificate Verification	1	0 – 2	0
5	Reserved	0		
6	Reserved	0		
	Serial Number	4	0000 – FFFF	
	Tail Character	1	$	$

✧ <*Server ID*>: The index of the Server.
- 0: The server is configured in the **AT+GTSRI** command.

✧ <*Mode*>: Specify whether the terminal enables the TLS function.
- 0: Disable the TLS function.
- 1: Enable the TLS function.

✧ <*Certificate Verification*>: Specify the certificate verification method for the terminal.
- 0: Do not verify the certificates. In this method, no certificates need to be built into the terminal.
- 1: Only server certification. In this method, at least the CA file needs to be built into the terminal.
- 2: Two-way certification between server and client. In this method, at least the CA file, Client Certificate file, Client key file need to be built into the terminal.

Note: TLS encryption is only valid for TCP connections.

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

➢ **+ACK:GTTLS,**

Example: **+ACK:GTTLS,BD0218,135790246811220,,0002,20090214093254,11F0$**			
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	(HEX)	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	(HEX)	
Tail Character	1	$	$

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	RTO Serial Number	<=1	0 - 1	0
8	Composition Mask	4	0000– 007F	007F
9	Power Saving Mode	1	1 – 2	1
10	Position Append Mask	2	00 – FF	00
11	Event Mask	4	000000 – FFFFFF	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**)
- <RTO Serial Number>: Configure the <Serial Number> parameter attached to the +RESP:GTSOD, +RESP:GTVDO, +RESP:GTPIC and +RESP:GTRFQ, and the file-name they generate will have serial number.
  - 0: Disable
  - 1: Enable
- <*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 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.

- 1: GPS deep saving mode.
- 2: GPS low saving mode.

✧ <*Position Append Mask*>: A bitwise numeral to control whether to include the corresponding fields after <*Cell ID*> in **+RESP:GTFRI/+RESP:GTERI**.

- Bit 0: The number of satellites in view for the current position.
- Bit 2: The number of satellites used in the current position.

✧ <*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 for **+RESP:GTWFS**
- 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**
- Bit 16 for **+RESP:GTTMZ**

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. **it probably block the device to enter sleep mode to save power consumption if the value is less than 80s.**

✧ <*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,,,,,,time.windows.com,,,,FFFF$**				
SN	**Parameter**	**Length (Byte)**	**Range/Format**	**Default**
1	Password	4 – 20	'0' – '9' 'a' – 'z' 'A' – 'Z'	cv200
2	Reserved			
3	Reserved			
4	Reserved			
5	Reserved			
6	Reserved			
7	NTP Address	<= 40		time.windows.com
8	Reserved			
9	Reserved			
10	Reserved			
	Serial Number	4	0000 – FFFF	
	Tail Character	1	$	$

✧ *<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. It is decided by parameters inside "AT+GTTMA" and generally it should be UTC + 0 time-zone if no setting in AT+GTTMA.

✧ <*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: Allows the mobile phone to connect to the device LAN, only for use with the mobile QuCam APP
- 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	<=6	000000-FFFFFF	3FF
6	Voice Option	<=2	0|1|7|8	0
7	Ring Alerts Mask	<=6	000000-FFFFFF	3
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.
  Bit13: Seatbelt unfastened detection.
  Bit14: Reserved.
  Bit15: Reserved.

Bit16: Forward collision warning.

Bit17: Pedestrian collision warning.

✧ **Bit18:** Headway monitoring warning.<*Voice Option*>: Configuration of TTS language.

- 0: English.
- 1: Spanish
- 7: Italian
- 8: Portuguese

✧ <*Ring Alerts Mask*>: Configuration of ring alerts when following events occur. Setting the bit to 1 means to enable it and 0 means to disable it.

Bit0: Recording Error

Bit1: Button Pressed

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=cv200,1,60,300,,,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|2	0
3	Detect Virtual Ignition	2	5 - 60 (sec)	60

	On Duration			
4	Detect Virtual Ignition Off Duration	<=3	60 - 600 (sec)	300
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: Hardwired Mode with ACC Input.
- 1: OBD Power Mode.

Note: If <Virtual Ignition Mode> = 1, please note whether the **AT+GTVVS** configuration matches the actual vehicle situation.

- 2: Cigar Lighter Power Mode. **Note:** If <Virtual Ignition Mode> = 2, the device powers off 5s later after the ignition (ACC) off.

✧ <Detect Virtual Ignition On Duration>: Duration configuration for detecting the virtual ignition on.

✧ <Detect Virtual Ignition Off Duration>: Duration configuration for detect the virtual ignition off duration.

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	$	$

2.2.2.9. Non-movement Detection

The **AT+GTNMD** command is used to configure the parameters for non-movement detection.

➢ **AT+GTNMD=**

Example: **AT+GTNMD=cv200,,2,3,4,,,,,,,,,FFFF$**				
SN	**Parameter**	**Length (Byte)**	**Range/Format**	**Default**
1	Password	4 – 20	'0' – '9' 'a' – 'z' 'A' – 'Z'	**cv200**
2	Reserved	0		
3	Non-movement Duration	<=3	1 – 255 (* 15sec)	2
4	Movement Duration	<=2	2 – 50 (* 100ms)	3
5	Movement Threshold	1	2 – 9	4
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	$	$

✧ <Non-movement Duration>: A time parameter to determine whether the device enters non-movement status. If the motion sensor detects that the device stays in non-movement status for a period of time specified by <Non-movement Duration>, the device will be considered to be in non-movement status.

✧ <Movement Duration>: A time parameter to determine whether the device enters movement status. If the motion sensor detects that the device stays in movement for a period of time specified by <Movement Duration>, the device will be considered to be in movement status.

✧ <Movement Threshold>: The threshold for the motion sensor to determine whether the device is in movement state. The smaller the value is, the easier it will be for the device to be considered to enter the state of movement.

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

➢ **+ACK:GTNMD,**

Example: **+ACK:GTNMD,BD0211,862170019025640,CV200,000B,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	$	$

2.2.2.10. Voltage Virtual Ignition

The command **AT+GTVVS** is used to configure parameters for detecting virtual ignition state by voltage. It works when **AT+GTVMS** <Virtual Ignition Mode> = 1.
Note: Please make sure hard-wired ignition line is not connected.

➢ **AT+GTVVS=**

Example:
AT+GTVVS=cv200,13500,600,10,1,10,000B$

SN	Parameter	Length (Byte)	Range/Format	Default
1	Password	4 – 20	'0' – '9' 'a' – 'z' 'A' – 'Z'	**cv200**
2	Ignition On Voltage	<=5	250 - 28000(mV)	13500
3	Voltage Offset	<=4	200 - 2000(mV)	600
4	Ignition On Debounce	<=3	5 – 255(x2s)	10
5	Smart Voltage Adjustment	1	0 | 1	1
6	Ignition Off Debounce	<=3	5 – 255(x2s)	10
	Serial Number	4	0000 – FFFF	
	Tail Character	1	$	$

✧ <Ignition On Voltage>: The external power voltage in ignition on state. Different vehicles have different voltage in ignition on state. This parameter should be set very close to the original external power so that the device can detect ignition event more accurately.

✧ <Voltage Offset>: The offset from <Ignition On Voltage> used to determine ignition on or ignition off state. If the voltage of the external power is higher than <Ignition On Voltage> - <Voltage Offset> and is maintained for <Ignition On Debounce> seconds, the device will consider it as in virtual ignition on state. If the voltage of the external power is lower than <Ignition On Voltage> - <Voltage Offset> and is maintained for <Ignition Off Debounce> seconds, the device will consider it as in virtual ignition off state.

Note: <Ignition On Voltage> and <Voltage Offset> values will be adjusted automatically according to measured external power voltage data if necessary to make the ignition measurement more precise.

✧ <Ignition On Debounce>: The debounce time before updating virtual ignition on state according to the external power voltage. Unit: x2 second.

✧ <Smart Voltage Adjustment>:
Enable/disable smart voltage adjustment algorithm.
- 0 - Disable. The values of <Ignition On Voltage> and <Voltage Offset> will remain unchanged.
- 1 - Enable. The values of <Ignition On Voltage> and <Voltage Offset> will dynamically change according to the actual ignition on and off voltage.

✧ <Ignition Off Debounce>: The debounce time before updating virtual ignition off state according to the external power voltage. Unit: x2 second.

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

➢ **+ACK:GTVVS,**

Example: **+ACK:GTVVS,BD0218,862170019025640,CV200,000B,20241014093254,11F0$**			
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	$	$

2.2.2.11. Remote File Transfer

The command **AT+GTRTP** is used to obtain files from the backend server.

➢ **AT+GTRTP=**

Example: **AT+GTRTP=cv200,0,0,0,http://60.174.225.173:20581/CV200/deltabin/server2.crt,,,,,,FFFF$**				
SN	**Parameter**	**Length (Byte)**	**Range/Format**	**Default**
1	Password	4 – 20	'0' – '9' 'a' – 'z' 'A' – 'Z'	cv200
2	Mode	1	0	

3	Protocol type	1	0|2	
4	File Type	1	0 – 2	
5	URL	<=100	ASCII (not including '=')	
6	Reserved			
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 file transfer.
  - 0: Download file.
- <*Protocol type*>: The type of communication protocol used to obtain data from the backend server.
  - 0: HTTP.
  - 2: FTP.
- <*File Type*>: It defines the type of file to download from the server.
  - 0: CA certificate
  - 1: Client certificate
  - 2: Client key
- <*URL*>: It specifies the URL to download the configuration file.

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

- **+ACK:GTRTP,**

Example: **+ACK:GTRTP,BD0218,135790246811220,,0002,20090214093254,11F0$**			
Parameter	**Length (Byte)**	**Range/Format**	**Default**
Full Protocol Version	10	8000000000 – 80FFFFFFFF	
Unique ID	15	(IMEI)	
Device Name	<=20	'0' - '9', 'a' - 'z', 'A' - 'Z', '-', '_'	
Serial Number	4	(HEX)	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	(HEX)	
Tail Character	1	$	$

2.2.2.12. Local File Transfer

The command **AT+GTLTP** is used to write the file to the device by subcontracting.

➢ **AT+GTLTP=**

Example: **AT+GTLTP=cv200,0,0,,,,,,,,,FFFF$**				
SN	**Parameter**	**Length (Byte)**	**Range/Format**	**Default**
1	Password	4 – 20	'0' – '9' 'a' – 'z' 'A' – 'Z'	cv200
2	Reserved	0		
3	Mode	1	0 – 1	
4	File Type	1	0 – 2	
5	Current Number	<=3	0 – 100	
6	Total Number	<=3	0 – 100	
7	Data	<=512	HEX	
8	CRC	<=4	0 – FFFF	
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 the file.
- 0: Delete file.
- 1: Write file.

✧ <*File Type*>: It defines the type of file to download from the server.
- 0: CA certificate
- 1: Client certificate
- 2: Client key

✧ <*Current Number*>: The location where the current data is written to the file.

✧ <*Total Number*>: Total serial number of write file data.

✧ <*Data*>: Data written to file.

✧ <*CRC*>: CRC verification data of <*Data*> used to determine whether the data is correct.

Note:

The command **AT+GTLTP** does not generate acknowledgment message.

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 2 and the engine is off. If <*IGF Report Interval*> is less than 80 seconds, the GNSS will be always on. It probably will block the device to enter sleep mode to save power consumption if the value is less than 80s. 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 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 for the <*CAN Data*> field in **+RESP:GTERI.**
  - 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	$	$

2.2.3.2. Frequency Change of Fixed Report Information

The command **AT+GTFFC** is used to change the parameters of fixed report when a certain event occurs, so that different report interval needs can be met. When the event disappears, the device will be restored to its previous settings.

The device supports up to 5 sets of parameters for different events. Priority is assigned among these events. Only the parameters of the highest priority event are applied if more than one event occurs at the same time.

➢ **AT+GTFFC=**

Example: **AT+GTFFC=cv200,4,3,1,10,,,500,,0,,,FFFF$**				
SN	**Parameter**	**Length (Byte)**	**Range/Format**	**Default**
1	Password	4 – 20	'0' – '9' 'a' – 'z' 'A' – 'Z'	cv200
2	Priority	1	0-4	0
3	Mode	1	0-3	0
4	FRI Mode	1	0-1	0
5	FRI IGN Report Interval	<=5	5-86400s	30
6	Reserved	0		
7	Reserved	0		
8	FRI IGF Report Interval	<=5	0|5-86400s	500
9	Reserved	0		
10	Corner Report	<=3	0 – 180	0
11	Reserved	0		
12	Reserved	0		
	Serial Number	4	0000 – FFFF	
	Tail Character	1	$	$

✧ <*Priority*>: The priority of the event which triggers the parameter change for fixed report. 0 indicates the highest priority.

✧ <*Mode*>: It specifies the trigger event for changing the fixed report parameters.

- 0: Disable the parameters of the specified priority.
- 1: Change the fixed report parameters when the device enters into any of the defined Geo-fence.
- 2: Change the fixed report parameters when the device enters into known LTE/WCDMA/GSM roaming state (Please refer to **AT+GTRMD**).
- 3: Change the fixed report parameters when the device enters into unknown

LTE/WCDMA/GSM roaming state.

- ✧ <*FRI Mode*>: If the specified event occurs, the working mode of the fixed report will be changed according to the value for this parameter.
  - 0: Do not change the working mode.
  - 1: Change the working mode to "Fixed Time Report".
- ✧ <*FRI IGN Report Interval*>: The time interval for sending the position information when the ignition is on. The value range is 5 – 86400. Unit: second.
- ✧ <*FRI IGF Report Interval*>: The interval for acquiring and sending the position information when the ignition is off if <*Power Saving Mode*> in **AT+GTCFG** is set to 2. The value range is 0|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 the non-zero value specified by this parameter, the device will send the corner report by **+RESP:GTFRI**.

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

➢ **+ACK:GTFFC,**

Example: **+ACK:GTFFC,BD0213,865084030960726,CV200,0037,20190411103557,0306$**			
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. Roaming Detection Configuration

The command **AT+GTRMD** is used to configure the parameters for network roaming detection.

- **AT+GTRMD=**

Example: **AT+GTRMD=cv200,0,,,,,1,1,,,,1,1,,,,1,1,,,,3D07,,,3D07,,,,,,,,,,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	Reserved	0		
4	Reserved	0		
5	Reserved	0		
6	Reserved	0		
7	Home Operator Start	<=2	1-10	1
8	Home Operator End	<=2	1-10	1
9	Home Operator List	<=6*10		
10	Reserved	0		
11	Reserved	0		

12	Roaming Operator Start	<=3	1-100	1
13	Roaming Operator End	<=3	1-100	1
14	Roaming Operator List	<=6*100		
15	Reserved	0		
16	Reserved	0		
17	Blacklist Operator Start	<=2	1-20	1
18	Blacklist Operator End	<=2	1-20	1
19	Black List Operator	<=6*20		
20	Reserved	0		
21	Reserved	0		
22	Known Roaming Event Mask	<=6	000000 – FFFFFF	3D07
23	Known Roaming Picture Upload Mask	<=8	00000000 – FFFFFFFF	0000
24	Known Roaming Video Upload Mask	<=8	00000000 – FFFFFFFF	6308
25	Unknown Roaming Event Mask	<=6	000000 – FFFFFF	3D07
26	Unknown Roaming Picture Upload Mask	<=8	00000000 – FFFFFFFF	0000
27	Unknown Roaming Video Upload Mask	<=8	00000000 – FFFFFFFF	6308
28	Reserved	0		
29	Reserved	0		
30	Reserved	0		
31	Reserved	0		
32	Reserved	0		
33	Reserved	0		
34	Reserved	0		
35	Reserved	0		
	Serial Number	4	0000 – FFFF	
	Tail Character	1	$	$

- <*Mode*>: The working mode of the roaming detection function.
  - 0: Disable this function.
  - 1: Enable this function.
- <*Operator Start*>: A numeral to indicate the first index of the whitelist operator numbers to be input. For example, if it is **1**, the device will update the whitelist operators from the **1**st one. If it is empty, there should be no whitelist number.
- <*Operator End*>: A numeral to indicate the last index of the whitelist operator numbers to be input. For example, if it is **2**, the device will update the whitelist operators until the **2**nd one. If it is empty, there should be no whitelist number.
- <*Home Operator List*>: A white list of PLMN codes for network operators. The numbers are composed of MCC and MNC, both of which consist of 3 digits. The last digit of MNC can be omitted (e.g. both "46001F" and "46001" are the PLMN of CHINA UNICOM). The operators in this list will be considered as in "Home" state. Two adjacent operator numbers are separated with '**,**'. The number of the operators in the list is determined by the parameters <*Operator Start*> and <*Operator End*>. For example, if <*Operator Start*> is 1 and <*Operator End*> is 2, the operator list should include 2 operator numbers (empty value acceptable) and the two numbers are separated by with ','. "MCCFF" type code is used to identify operators across a whole country. For example, "460FF" covers mobile network operators all across China.
- <*Roaming Operator List*>: It is mostly like the <*Home Operator List*>, and the difference is that the operators in this list will be considered as in "Known Roaming" state.
- <*Black List Operator*>: It is mostly like the <*Home Operator List*>, and the difference is that the operators in this list will be considered as in "Blocking Report" state. In this state, the device works normally but all reports will be buffered instead of being sent.
  Operators that are not in <*Home Operator List*>, <*Roaming Operator List*> or <*Black List Operator*> will be considered as in "Unknown Roaming" state.
- <*Known Roaming Event Mask*>: Bitwise mask to configure which event report should be sent to the backend server when roaming state is detected. If the roaming state indicates "Known Roaming", the <*Known Roaming Event Mask*> will be valid. Otherwise, the <*Unknown Roaming Event Mask*> will be valid.
  - 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 for **+RESP:GTWFS**
  - 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**
- Bit 15 for **+RESP:GTTMZ**

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

✧ <*Unknown Roaming Event Mask*>: It is mostly like the <*Known Roaming Event Mask*>.

✧ <*Known Roaming 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. If the roaming state indicates "Known Roaming", the <*Known Roaming Picture Upload Mask*> will be valid. Otherwise, the <*Unknown Roaming Picture Upload Mask*> will be valid.

- 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.
- Bit 23: Seatbelt unfastened detection.
- Bit 24: Reserved.
- Bit 25: Reserved.
- Bit 26: Forward Collision Warning detection.
- Bit 27: Pedestrian Collision Warning detection.
- Bit 28: Headway Monitoring Warning detection.

✧ <*Known Roaming Video Upload Mask*>: It is mostly like the <*Known Roaming Picture Upload Mask*>.

✧ <*Unknown Roaming Picture Upload Mask*>: It is mostly like the <*Known Roaming Picture Upload Mask*>.

✧ <*Unknown Roaming Video Upload Mask*>: It is mostly like the <*Known Roaming Picture Upload Mask*>.

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

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

➢ **+ACK:GTRMD,**

Example: **+ACK:GTRMD,BD0213,865084030960726,CV200,0041,20190411104003,030E$**			
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'	
Serial Number	4	0000 – FFFF	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

Note: Only an AT command string of no more than 180 bytes could be accepted by the device in case of sending the command string via Manage Tool (there is no such limit for sending the command via network).

As **AT+GTRMD** contains a large amount of configuration information in PLMN code list, make sure the command length does not exceed 180 bytes through proper <*Start Index*> and <*End Index*> settings. A color alert will occur on Command Text Box which turns yellow if there is a command of over 180 bytes to be sent via Manage Tool.

2.2.4.4. 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	$	$

2.2.4.5. 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	$	$

2.2.4.6. 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	$	$

2.2.4.7. 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	$	$

2.2.4.8. Harsh Behavior Monitoring

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

➢ **AT+GTHBM=**

Example: **AT+GTHBM=cv200,1,200,,,,50,300,,,,40,40,40,100,5,5,60,3,3,2,2,1,,FFFF$**				
SN	**Parameter**	**Length (Byte)**	**Range/Format**	**Default**
1	Password	4 – 20	'0' – '9' 'a' – 'z' 'A' – 'Z'	cv200
2	Mode	1	0 -1	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	High Speed	<=3	100 – 400km/h	100
16	Vhb	<=3	0-100km/h	0
17	Vha	<=3	0-100km/h	0
18	Medium Speed	<=3	60 – 100km/h	60
19	Vmb	<=3	0-100km/h	0
20	Vma	<=3	0-100km/h	0
21	Vlb	<=3	0-100km/h	0
22	Vla	<=3	0-100km/h	0
23	Report Mode	1	0-2	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.

✧ *<High Speed>,<Medium Speed>*: If the last known speed of the device read from GNSS is greater than or equal to <High Speed>, the vehicle that the device is attached to is considered to be at high speed.

If the last known speed is less than <High Speed> but greater than or equal to <Medium Speed>, the vehicle is considered to be at medium speed.

If the last known speed is less than <Medium Speed>, the vehicle is considered to be at low speed.

✧ <ΔVhb>: The threshold for harsh braking at high speed level.

If the current speed is less than the last known speed and the change of the speed is greater than or equal to this value within <Deceleration Duration> seconds, harsh braking is detected at high speed level.

If it is set to 0, it means “Do not monitor harsh braking behavior at high speed level”.

✧ <ΔVha>: The threshold for harsh acceleration at high speed level.

If the current speed is greater than the last known speed and the change of the speed is greater than or equal to this value within <Acceleration Duration> seconds, harsh acceleration is detected at high speed level.

If it is set to 0, it means “Do not monitor harsh acceleration behavior at high speed level”.

✧ <ΔVmb>: The threshold for harsh braking at medium speed level.

If the current speed is less than the last known speed and the change of the speed is greater than or equal to this value within <Deceleration Duration> seconds, harsh braking is detected at medium speed level.

If it is set to 0, it means “Do not monitor harsh braking behavior at medium speed level”.

✧ <ΔVma>: The threshold for harsh acceleration at medium speed level.

If the current speed is greater than the last known speed and the change of the speed is greater than or equal to this value within <Acceleration Duration> seconds, harsh acceleration is detected at medium speed level.

If it is set to 0, it means “Do not monitor harsh acceleration behavior at medium speed level”.

✧ <ΔVlb>: The threshold for harsh braking at low speed level.

If the current speed is less than the last known speed and the change of the speed is greater

than or equal to this value within <Deceleration Duration> seconds, harsh braking is detected at low speed level.

If it is set to 0, it means "Do not monitor harsh braking behavior at low speed level".

✧ <ΔVla>: The threshold for harsh acceleration at low speed level.

If the current speed is greater than the last known speed and the change of the speed is greater than or equal to this value within <Acceleration Duration> seconds, harsh acceleration is detected at low speed level.

If it is set to 0, it means "Do not monitor harsh acceleration behavior at low speed level".

✧ *<Report Mode>*: Whether to report +RESP:GTHBE/+RESP:GTHBM to the backend server.

- 0: Do not report +RESP:GTHBE, only report +RESP:GTHBM.
- 1: Report +RESP:GTHBE and +RESP:GTHBM.
- 2: Do not report +RESP:GTHBM, only report +RESP:GTHBE.

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	$	$

2.2.4.9. 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=cv200,2,15,23,,1,500,500,0,0,,0,30,30,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 – 160	15
4	High Shock Sensitivity	<=2	Crash Threshold <= (X) <=160	23
5	Reserved	0		
6	Sampling Start	1	1	1
7	Samples Before Crash	4	1-1600	500
8	Samples After Crash	4	1-1600	500
9	Report ACC Mode	1	0 | 1	0
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 <=160. 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.
  - 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 ACC Mode>: A numeral which indicates whether to report the acceleration data to the backend server.
  - 0: Disable the acceleration report.
  - 1: Enable the acceleration report. The device will report 75 sets of tri-axial acceleration data to the backend server in the **+RESP:GTACC**.
- <*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	$	$

2.2.4.10. 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	$	$

2.2.4.11. 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	<=2	1 – 8, 20 – 22	
3	Mode	1	0 – 1	0
4	Trigger Speed	<=3	Please see the table below.	
5	Reserved	0		
6	Silent Duration	<=3	Please see the table below.	

7	Sensitivity Level	1	0 – 2	1
8	Reserved	0		
9	Report Enable	1	0 – 1	1
10	Right Hand Drive Vehicles	1`	0 – 1	0
11	DMS Distract Scope	<=13		-30|30|30|-30
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.
  - 8: Seatbelt unfastened.
  - 20: Forward collision warning.
  - 21: Pedestrian collision warning.
  - 22: Headway monitoring warning.
- <*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)
- <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.
- <Sensitivity Level>: Specify a sensitivity level for driver status event detection.
  - 0: High
  - 1: Medium
  - 2: Low
- <Report Enable>: It defines whether to report the message **+RESP:GTDSS**

- <Right Hand Drive Vehicles>: It specifies whether the car is a left-hand or right-hand drive vehicle. 1 means right-hand. Only valid for **Event ID 8**.
- <DMS Distract Scope>: Only valid for **Event ID 3,** consists of multiple parameters and separated by vertical bars ("|"), like this "-30|30|30|-30":
  - Left yaw, range: -90 – 0
  - Right yaw, range: 0 – 90
  - Up pitch, range: 0 – 90
  - Down pitch, range: -90 – 0

Note: in the case of GPS fix failed, it may result in that the ADAS/DMS features are invalid, for instance, when the device is going across the tunnels.

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

Event	Description	Trigger Speed (km/h)	Silent Duration (second)
Eye Close	Track the driver's eye, head, and face movements to detect distraction and identify even the earliest signs of fatigue – making sure that focus stays on the road ahead.	0, 30-255	120-180
Yawning			
Distraction		30-255	
Smoking	Identify and alert when smoking behavior is detected, minimizing fire hazards and reducing distractions to promote a healthier and safer driving environment.	0, 30-255	
Phone Use	Identifies handheld device usage while driving, encouraging compliance with hands-free laws and reducing distraction-related accidents.		
Driver abnormal	Detect and alert that the driver left the driver's seat or deviated from his seat too far.		
IR blocking	Detect if the driver is wearing IR blocking glasses that will block the eyes recognition.		
Seatbelt unfastened	Alert when the driver's seatbelt is not fastened, ensuring compliance with safety regulations and reducing the risk of injury in case of an accident.		
Forward collision	Monitor the area in front of the	30-255	

Event	Description	Trigger Speed (km/h)	Silent Duration (second)
warning	vehicle and warning the driver of an imminent collision.		
Pedestrian collision warning	Detect pedestrians in the vehicle's path and alert the driver to potential collisions.		
Headway monitoring warning	Monitor the distance to the vehicle ahead. An alert is issued if the distance becomes unsafe.		

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

Event	Trigger Speed (km/h)	Silent Duration (second)
Eye Close	0	180
Yawning	0	180
Distraction	30	180
Smoking	0	180
Phone Use	0	180
Driver abnormal	0	180
IR blocking	0	180
Seatbelt unfastened	0	180
Forward collision warning	30	180
Pedestrian collision warning	30	180
Headway monitoring warning	30	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	<=2	1 – 8, 20 – 22	
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

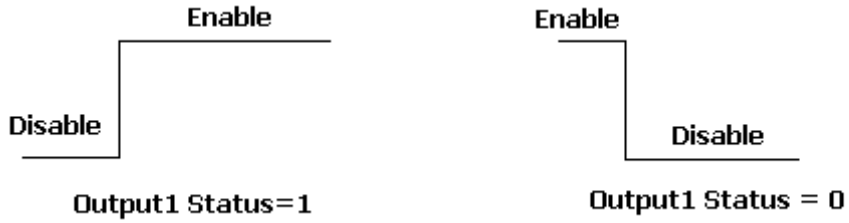


Figure 2: Waveform 1

Waveform 2:

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

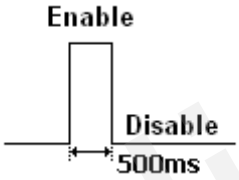


Figure 3: Waveform 2

Waveform 3:

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

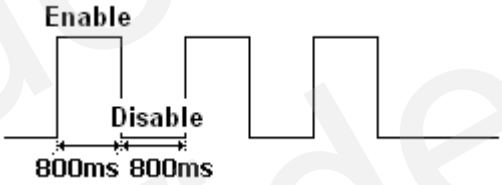


Figure 4: Waveform 3

Waveform 4:

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

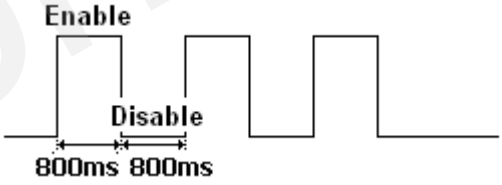


Figure 5: Waveform 4

➢ **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,,,,,FFFF$**				
SN	**Parameter**	**Length (Byte)**	**Range/Format**	**Default**
1	Password	4 – 20	'0' – '9' 'a' – 'z' 'A' – 'Z'	cv200
2	Working Mode	<=2	0 – 1 | 12	0
3	Baud Rate Index	<=2	1 – 12	12
4	Data Bits	1	7 – 8	8
5	Stop Bits	1	1 – 2	1
6	Parity Bits	1	0 – 2	0
7	Reserved	0		
8	Reserved	0		
9	Reserved	0		
10	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.
- 9: Used for camera.
- 12: Used for CANBUS device connected to a vehicle. Two reserved parameters are used as follows.

CANBUS Device Type	1	0 – 1	0
Reserved	0		

  - CANBUS Device Type: The type of CANBUS device.
    - 0: CAN100 STD
    - 1: CAN100 STD_THR

Note: This working mode is valid only when the <*Communication Type*> is 0 in the **AT+GTCAN** command.

✧ <*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$**				
SN	**Parameter**	**Length (Byte)**	**Range/Format**	**Default**
1	Password	4 – 20	'0' – '9' 'a' – 'z' 'A' – 'Z'	cv200
2	Command Type	1	0 – 3	
3	Reserved	0		
4	Data	<= 1280	ASCII Code	
5	Reserved	0		
6	Hex Convert	1	0|1	0
7	Reserved	0		
8	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	$	$

2.2.6.3. CANBUS Device Configuration

This command **AT+GTCAN** is used to set the CANBUS device configuration for reporting CANBUS device information (**+RESP:GTCAN**) which mainly contains VIN, vehicle speed, engine speed, engine coolant temperature and other information.

➢ **AT+GTCAN=**

Example: **AT+GTCAN=cv200,1,0,0,C00FFFFF,00,0,001FFFFF,,C0,0,0,1,0,0,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	CAN Report Interval	<=5	0|5 – 86400sec	0
4	CAN Report Interval IGF	<=5	0|5 – 86400sec	0
5	CAN Report Mask	8	0 – FFFFFFFF	C00FFFFF
6	Additional Event Mask	<=2	0 – FF	0
7	Communication Type	1	0|1	0
8	CAN Report Expansion Mask	8	0 – FFFFFFFF	001FFFFF
9	Reserved	0		
10	Electric Report Mask	<=8	00000000 - FFFFFFFF	C0
11	Tacho Report Mask	<=8	0 – FFFFFFFF	0
12	Tacho Report Interval	<=5	0|5 – 86400sec	0
13	CAN Report Expansion Mask1	<=8	0 – FFFFFFFF	1
14	Tachograph Driver1 Working Time Mask	<=8	0 – FFFFFFFF	0
15	Tachograph Driver2 Working Time Mask	<=8	0 – FFFFFFFF	0
	Serial Number	4	0000 – FFFF	
	Tail Character	1	$	$

- <*Mode*>: The working mode of this function.
  - 0: Disable this function.
  - 1: Enable this function.
- <*CAN Report Interval*>: The time interval for sending the **+RESP:GTCAN** report message to the backend server when the ignition is on. Its value range is 0|5 – 86400 and the unit is second. 0 means "Do not report the message **+RESP:GTCAN**".
- <*CAN Report Interval IGF*>: The time interval for sending the **+RESP:GTCAN** report message to the backend server when the ignition is off. Its value range is 0|5 – 86400 and the unit is second. 0 means "Do not report the message **+RESP:GTCAN** in ignition off state.
- <*Additional Event Mask*>: A bitwise numeral to control whether to send the **+RESP:GTCAN** message by additional event mask, 0 means "Ignore all additional events".
  - Bit 0: By ignition on/off event.
  - Bit 1: When the <*Tachograph Driver 1 Card Number*> changes.
  - Bit 2: When the <*Tachograph Driver 2 Card Number*> changes.
  - Bit 3: When the Driver1 working status in the parameter <*Tachograph Information*> changes.
  - Bit 4: when the Driver2 working status in the parameter <*Tachograph Information*>

changes.

- Bit 5: When the value of the <*Ignition Key*> parameter has changed.
- Bit 6: when the "Out of Scope" condition in the parameter <*Tachograph Information Expand*> changes.

✧ <*Communication Type*>: The communication type of CANBUS device.

- 0: Communication with the second serial port.
- 1: Communication with BLE.

✧ <*CAN Report Mask*>: Bitwise mask to configure the composition of CAN report message.

Mask Bit	Item	Description
Bit 31	<*GSM Information*>	Including <*MCC*>, <*MNC*>, <*LAC*>, <*Cell ID*> and the <*Reserved*> parameter value "00"
Bit 30	<*GNSS Information*>	Including <*GNSS Accuracy*>, <*Speed*>, <*Azimuth*>, <*Altitude*>, <*Longitude*>, <*Latitude*>, <*GNSS UTC Time*>
Bit 29	<*CAN Report Expansion Mask*>	If this bit is set to 1, the parameter <*CAN Report Expansion Mask*> in **AT+GTCAN** is valid. If this bit is set to 0, the parameter <*CAN Report Expansion Mask*> in **AT+GTCAN** is not valid.
Bit 28	<*Electric Report Mask*>	If this bit is set to 1, the parameter <Electric Report Mask> in **AT+GTCAN** is valid. If this bit is set to 0, the parameter <Electric Report Mask> in **AT+GTCAN** is invalid.
Bit 27	<*Handbrake Applies During Ride Count*>	Counts events when handbrake is pulled-up while driving (speed is greater than 5 km/h).
Bit 26	<*Total Engine Cold Running Time*>	Total driving time with cold engine (engine coolant temperature below 70°C.
Bit 25	<*Engine Starts by Ignition Count*>	Total number of engine starts by ignition.
Bit 24	<*Engine All Starts Count*>	Total number of engine starts.
Bit 23	<*Engine Cold Starts Count*>	Number of cold engine starts.
Bit 22	Reserved	
Bit 21	<*Total Vehicle Engine Overspeed Time*>	The total time when the vehicle engine speed is greater than the limit defined in CAN100 configuration
Bit 20	<*Total Vehicle Overspeed Time*>	The total time when the vehicle speed is greater than the limit defined in CAN100 configuration
Bit 19	<*Doors*>	An 8-bit hexadecimal number. Each bit indicates information of one door.

Bit 18	*<Lights>*	An 8-bit hexadecimal number. Each bit indicates information of one light.
Bit 17	*<Detailed Information/Indicators>*	A hexadecimal number. Each bit indicates information of one indicator.
Bit 16	*<Tachograph Information>*	Two bytes. The higher byte describes driver 2 (the one whose card is inserted in tachograph slot 2), and the lower byte describes driver 1.
Bit 15	*<Axle Weight 2nd>*	Weight of vehicle's second axle
Bit 14	*<Total Idle Fuel Used>*	Number of liters of fuel used since vehicle manufacture or device installation. Total idle fuel or energy used - with vehicle speed 0 km/h.
Bit 13	*<Total Engine Idle Time>*	Time of engine running during idling status (vehicle at a standstill) since vehicle manufacture or device installation
Bit 12	*<Total Driving Time>*	Time of engine running during driving (non-zero speed) since vehicle manufacture or device installation
Bit 11	*<Total Engine Hours>*	Time of engine running since vehicle manufacture or device installation
Bit 10	*<Accelerator Pedal Pressure>*	Pressure applied onto accelerator pedal
Bit 9	*<Range>*	The number of kilometers to drive on remaining fuel
Bit 8	*<Fuel Level>*	The level of fuel in vehicle's tank (in liters or percentage)
Bit 7	*<Fuel Consumption>*	The fuel consumption of the engine
Bit 6	*<Engine Coolant Temperature>*	Engine coolant temperature
Bit 5	*<Engine RPM>*	Revolutions per minute of the engine
Bit 4	*<Vehicle Speed>*	Vehicle road speed
Bit 3	*<Total Fuel Used>*	Number of liters of fuel used since vehicle manufacture or device installation. Total fuel or energy used - read from vehicle.
Bit 2	*<Total Distance>*	Vehicle total distance
Bit 1	*<Ignition Key>*	Ignition status
Bit 0	*<VIN>*	Vehicle identification number

✧ <*CAN Report Expansion Mask*>: Bitwise mask to configure the composition of expanded CANBUS information of the **+RESP:GTCAN** report message.

Mask Bit	Item	Description
Bit 31	*<CAN Report Expansion Mask1>*	If this bit is set to 1, the parameter <*CAN Report Expansion Mask1*> in **AT+GTCAN** is valid. If this bit is set to 0, the parameter <*CAN Report Expansion Mask1*> in **AT+GTCAN** is not valid.
Bit 30	*<Tachograph Information Expand>*	A hexadecimal number. It is an expansion of the parameter <*Tachograph Information*>. This parameter is represented in four bytes.
Bit 29	*<Gaseous Fuel Level>*	The alternative fuel levels.
Bit 28	*<DTC Codes>*	
Bit 27	*<Tachograph Driver2 Working Time Mask>*	If this bit is set to 1, the parameter <*Tachograph Driver2 Working Time Mask*> in **AT+GTCAN** is valid. If this bit is set to 0, the parameter <*Tachograph Driver2 Working Time Mask*> in **AT+GTCAN** is not valid.
Bit 26	*<Tachograph Driver1 Working Time Mask>*	If this bit is set to 1, the parameter <*Tachograph Driver1 Working Time Mask*> in **AT+GTCAN** is valid. If this bit is set to 0, the parameter <*Tachograph Driver1 Working Time Mask*> in **AT+GTCAN** is not valid.
Bit 25	*<Ambient Temperature>*	
Bit 24	*<Service Distance>*	The parameter describes distance left to diagnostic car review.
Bit 23	*<Engine Torque>*	The engine torque. Unit: percentage.
Bit 22	*<Rapid Accelerations>*	Total number of rapid accelerations since installation (calculation based on CAN 100 settings of speed increase time and value)
Bit 21	*<Rapid Brakings>*	Total number of rapid brakings since installation (calculation based on CAN 100 settings of speed decrease time and value)
Bit 20	*<Expansion Information>*	A hexadecimal number. Each bit contains information of one indicator.
Bit 19	*<Registration Number>*	The vehicle registration number

Bit 18	*<Tachograph Driver 2 Name>*	The name of tachograph driver 2
Bit 17	*<Tachograph Driver 1 Name>*	The name of tachograph driver 1
Bit 16	*<Tachograph Driver 2 Card Number>*	The card number of tachograph driver 2
Bit 15	*<Tachograph Driver 1 Card Number>*	The card number of tachograph driver 1
Bit 14	*<Total Brake Applications>*	Count of applying brake pedal (braking process initiated by brake pedal)
Bit 13	*<Total Accelerator Kick-down Time>*	Total time when accelerator pedal is pressed over 90%
Bit 12	*<Total Cruise Control Time>*	Total time when the vehicle speed is controlled by cruise-control module
Bit 11	*<Total Effective Engine Speed Time>*	Total time when the vehicle engine speed is effective
Bit 10	*<Total Accelerator Kick-downs>*	Count of accelerator pedal kick-downs (with the pedal pressed over 90%)
Bit 9	*<Pedal Braking Factor>*	It measures how often the driver brakes with brake pedal or with engine and stores both counts (which are always increasing). Decreasing speed with brake pedal pressed causes increase of pedal braking factor.
Bit 8	*<Engine Braking Factor>*	It measures how often driver brakes with brake pedal or with engine and stores both counts (which are always increasing). Decreasing speed with no pedal pressed causes increase of engine braking factor.
Bit 7	*<Analog Input Value>*	Analog input value
Bit 6	*<Tachograph Driving Direction>*	Vehicle driving direction from tachograph
Bit 5	*<Tachograph Vehicle Motion Signal>*	Vehicle motion signal from tachograph
Bit 4	*<Tachograph Overspeed Signal>*	Tachograph overspeed signal for the vehicle
Bit 3	*<Axle Weight 4th>*	Weight of vehicle's fourth axle
Bit 2	*<Axle Weight 3rd>*	Weight of vehicle's third axle
Bit 1	*<Axle Weight 1st>*	Weight of vehicle's first axle

Bit 0	*<Ad-Blue Level>*	The level of Ad-Blue

<Electric Report Mask>: Bitwise mask to configure the composition of electric vehicle information in the **+RESP:GTCAN** message.

Mask Bit	Item	Description
Bit 31	Reserved	
…		
Bit 15	<Battery Charging Remaining Time>	The parameter shows time remaining for the battery of electric vehicle to be fully charged by connected charger.
Bit 14	*<Total Energy Charged>*	Sum of energy transmitted to battery from external charger.
Bit 13	*<Total Energy Used When Idling>*	With vehicle speed 0 km/h.
Bit 12	*<Total Energy Used>*	Sum of energy used by car's engine and equipment; recuperated energy does not affect this parameter.
Bit 11	*<Battery State of Health (SoH)>*	For electric cars, this parameter stands for battery general condition (100% means brand new, 0% totally damaged).
Bit 10	*<Battery Instantaneous Power>*	For electric cars, this parameter stands for instantaneous power used by (positive values) or recuperated from (negative values) the car.
Bit 9	<Battery Charging Current>	It indicates the electric vehicle's battery charging current.
Bit 8	*<Battery Temperature>*	Indicates the battery temperature.
Bit 7	*<Charging States>*	The status of battery charging and charging cable connected in electric cars.
Bit 6	<Battery Level>	The battery charge level.
Bit 5	Reserved	
Bit 4	Reserved	
Bit 3	Reserved	
Bit 2	*<Total Energy Recuperated>*	Sum of energy transmitted to battery with no charger connected.

Bit 1	*<Battery Charging Cycles Count>*	For electric cars, this parameter counts cycles of battery charging (increments at every finished cycle of charging).
Bit 0	*<Battery Instantaneous Voltage>*	For electric cars, this parameter stands for instantaneous high voltage of battery cells. (Read from BMS)

✧ <*Tacho Report Mask*>: A bitwise numeral to control whether to send the **+RESP:GTACN** message by tacho report mask, 0 means "Do not report **+RESP:GTACN** message".

Mask Bit	Item	Description
Bit 31	Reserved	Reserved for expansion
…		
Bit 3	*<Tachograph Driver 2 Card Number>*	The card number of tachograph driver 2
Bit 2	*<Tachograph Driver 1 Card Number>*	The card number of tachograph driver 1
Bit 1	*<Tachograph Information>*	Two bytes. The higher byte describes driver 2 (the one whose card is inserted in tachograph slot 2), and the lower byte describes driver 1.
Bit 0	*<Ignition State>*	Ignition status, the hard-wired ignition line must be connected.

✧ <*Tacho Report Interval*>: The time interval for sending the **+RESP:GTACN** report message to the backend server when the ignition is on. Its value range is 0|5 – 86400 and the unit is second. 0 means "Do not report the **+RESP:GTACN** message".

✧ <*CAN Report Expansion Mask1*>: It expands CANBUS information in **+RESP:GTCAN** report. Bitwise report mask to configure the composition of expanded CANBUS information of **+RESP:GTCAN** report.

Mask Bit	Item	Description
Bit 3---Bit 31	Reserved	
Bit 2	*<Tacho Timestamp>*	Real time clock is a date and time displayed on the vehicle's dashboard, usually read from tachograph.
Bit 1	*<Power Mode>*	Power mode.
Bit 0	*<Retarder Usage>*	The usage of Retarder.

✧ <*Tachograph Driver1 Working Time Mask*>: It expands CANBUS information in **+RESP:GTCAN** report. Bitwise report mask to configure the composition of expanded CANBUS information of **+RESP:GTCAN** report.

Mask Bit	Item	Description

Bit 31	Reserved	
Bit 30	Reserved	
Bit 29	*<Drv1 Maximum Daily Driving Time>*	Driver 1: Maximum daily driving time.
Bit 28	*<Drv1 Cumulative Uninterrupted Rest Time>*	Driver 1: Cumulative uninterrupted rest time.
Bit 27	*<Drv1 Current Weekly Driving Time>*	Driver 1: Current weekly driving time.
Bit 26	*<Drv1 Current Daily Driving Time>*	Driver 1: Current daily driving time.
Bit 25	*<Drv1 Accumulated Driving Time Previous and Current Week>*	Driver 1: Accumulated driving time previous and current week.
Bit 24	*<Drv1 Current Duration of Selected Activity>*	Driver 1: Current duration of selected activity.
Bit 23	*<Drv1 Cumulative Break Time>*	Driver 1: Cumulative break time.
Bit 22	*<Drv1 Continuous Driving Time>*	Driver 1: Continuous driving time.
Bit 21	Reserved	Reserved for Additional information.
Bit 20	*<Drv1 Open Compensation in 2nd Week Before Last>*	Driver 1: Open compensation in the second week before last.
Bit 19	*<Drv1 Open Compensation in Week Before Last>*	Driver 1: Open compensation in week before last.
Bit 18	*<Drv1 Open Compensation in The Last Week>*	Driver 1: Open compensation in the last week.
Bit 17	*<Drv1 Minimum Weekly Rest>*	Driver 1: Minimum weekly rest.
Bit 16	*<Drv1 Time Left Until New Weekly Rest Period>*	Driver 1: Time left until new weekly rest period.
Bit 15	*<Drv1 Remaining*	Driver 1: Remaining driving time of current week.

	Driving Time of Current Week>	
Bit 14	*<Drv1 Minimum Daily Rest>*	Driver 1: Minimum daily rest.
Bit 13	*<Drv1 Time Left Until New Daily Rest Period>*	Driver 1: Time left until new daily rest period.
Bit 12	*<Drv1 Remaining Driving Time on Current Shift>*	Driver 1: Remaining driving time on current shift.
Bit 11	*<Drv1 Duration of Next Driving Period>*	Driver 1: Duration of next driving period.
Bit 10	*<Drv1 Time Left Until Next Driving Period>*	Driver 1: Time left until next driving period.
Bit 9	*<Drv1 Remaining Time of Current Break Rest>*	Driver 1: Remaining time of current break rest.
Bit 8	*<Drv1 Duration of Next Break Rest>*	Driver 1: Duration of next break rest.
Bit 7	*<Drv1 Remaining Time Until Next Break or Rest>*	Driver 1: Remaining time until next break or rest.
Bit 6	*<Drv1 Remaining Current Drive Time>*	Driver 1: Remaining current drive time.
Bit 5	*<Drv1 Number of Used Reduced Daily Rest Periods>*	Driver 1: Number of times 9h daily driving times exceeded.
Bit 4	*<Drv1 Number of Times 9h Daily Driving Times Exceeded>*	Driver 1: Number of times 9h daily driving times exceeded.
Bit 3	*<Drv1 Maximum Daily Period>*	Driver 1: Tachograph drivers' maximum daily period.
Bit 2	*<Drv1 End of Second Last Weekly Rest Period>*	Driver 1: End of second last weekly rest period.
Bit 1	*<Drv1 End of Last Weekly Rest Period>*	Driver 1: End of last weekly rest period.
Bit 0	*<Drv1 End of Last*	Driver 1: End of last daily rest period.

	Daily Rest Period>	

✧ <*Tachograph Driver2 Working Time Mask*>: It expands CANBUS information in **+RESP:GTCAN** report. Bitwise report mask to configure the composition of expanded CANBUS information of **+RESP:GTCAN** report.

Mask Bit	Item	Description
Bit 31	Reserved	
Bit 30	Reserved	
Bit 29	<*Drv2 Maximum Daily Driving Time*>	Driver 2: Maximum daily driving time.
Bit 28	<*Drv2 Cumulative Uninterrupted Rest Time*>	Driver 2: Cumulative uninterrupted rest time.
Bit 27	<*Drv2 Current Weekly Driving Time*>	Driver 2: Current weekly driving time.
Bit 26	<*Drv2 Current Daily Driving Time*>	Driver 2: Current daily driving time.
Bit 25	<*Drv2 Accumulated Driving Time Previous and Current Week*>	Driver 2: Accumulated driving time previous and current week.
Bit 24	<*Drv2 Current Duration of Selected Activity*>	Driver 2: Current duration of selected activity.
Bit 23	<*Drv2 Cumulative Break Time*>	Driver 2: Cumulative break time.
Bit 22	<*Drv2 Continuous Driving Time*>	Driver 2: Continuous driving time.
Bit 21	Reserved	Reserved for Additional information.
Bit 20	<*Drv2 Open Compensation in 2nd Week Before Last*>	Driver 2: Open compensation in the second week before last.
Bit 19	<*Drv2 Open Compensation in Week Before Last*>	Driver 2: Open compensation in week before last.
Bit 18	<*Drv2 Open Compensation in the Last Week*>	Driver 2: Open compensation in the last week.

Bit 17	*<Drv2 Minimum Weekly Rest>*	Driver 2: Minimum weekly rest.
Bit 16	*<Drv2 Time Left Until New Weekly Rest Period>*	Driver 2: Time left until new weekly rest period.
Bit 15	*<Drv2 Remaining Driving Time of Current Week>*	Driver 2: Remaining driving time of current week.
Bit 14	*<Drv2 Minimum Daily Rest>*	Driver 2: Minimum daily rest.
Bit 13	*<Drv2 Time Left Until New Daily Rest Period>*	Driver 2: Time left until new daily rest period.
Bit 12	*<Drv2 Remaining Driving Time on Current Shift>*	Driver 2: Remaining driving time on current shift.
Bit 11	*<Drv2 Duration of Next Driving Period>*	Driver 2: Duration of next driving period.
Bit 10	*<Drv2 Time Left Until Next Driving Period>*	Driver 2: Time left until next driving period.
Bit 9	*<Drv2 Remaining Time of Current Break Rest>*	Driver 2: Remaining time of current break rest.
Bit 8	*<Drv2 Duration of Next Break Rest>*	Driver 2: Duration of next break rest.
Bit 7	*<Drv2 Remaining Time Until Next Break or Rest>*	Driver 2: Remaining time until next break or rest.
Bit 6	*<Drv2 Remaining Current Drive Time>*	Driver 2: Remaining current drive time.
Bit 5	*<Drv2 Number of Used Reduced Daily Rest Periods>*	Driver 2: Number of times 9h daily driving times exceeded.
Bit 4	*<Drv2 Number of Times 9h Daily Driving Times Exceeded>*	Driver 2: Number of times 9h daily driving times exceeded.
Bit 3	*<Drv2 Maximum Daily Period>*	Driver 2: Tachograph drivers' maximum daily period.

Bit 2	*<Drv2 End of Second Last Weekly Rest Period>*	Driver 2: End of second last weekly rest period.
Bit 1	*<Drv2 End of Last Weekly Rest Period>*	Driver 2: End of last weekly rest period.
Bit 0	*<Drv2 End of Last Daily Rest Period>*	Driver 2: End of last daily rest period.

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

- **+ACK:GTCAN,**

Example: **+ACK:GTCAN,BD0211,135790246811220,,000D,20090214093254,FFFF$**			
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	$	$

2.2.6.4. CANBUS Alarm Setting

The **AT+GTCLT** command is used to set alarm threshold of CANBUS data. The **AT+GTCLT** can support 20 CANBUS alarm groups at most. Each CAN alarm trigger condition consists of <*Alarm Mask 1*>, <*Alarm Mask 2*> and <*Alarm Mask 3*>. For the CAN alarm trigger event information, please refer to <*Detailed Information / Indicators*>, <*Lights*>, <*Doors*> and <*Engine RPM*> of the **+RESP:GTCAN** message. If <*Alarm Mask 1*>, <*Alarm Mask 2*> and <*Alarm Mask 3*> meet each trigger condition at the same time, and the trigger event duration time is longer than <*Debounce Time*>, the **+RESP:GTCLT** alarm message will be sent.

Note: The **AT+GTCLT** and **AT+GTCAN** commands are used together. Only when all of <*Alarm Mask 1*>, <*Alarm Mask 2*> and <*Alarm Mask 3*> meet trigger condition and the trigger event duration time is longer than <*Debounce Time*> will the **+RESP:GTCLT** alarm message be sent.

- **AT+GTCLT=**

Example: **AT+GTCLT=cv200,1,0,0,000FFFFF,00000000,00000000,00000000,30,8,,,,,,,,0006$**				
SN	**Parameter**	**Length (Byte)**	**Range/Format**	**Default**
1	Password	4 – 20	'0'–'9' 'a'–'z' 'A'–'Z'	cv200
2	Group ID	<=2	0 – 19	0
3	Mode	1	0|1	0
4	Debounce Time	<=3	0 – 255(×1s)	0
5	CAN Data Mask	8	0 – FFFFFFFF	000FFFFF
6	Alarm Mask 1	<=8	0 – FFFFFFFF	0
7	Alarm Mask 2	<=8	0 – FFFFFFFF	0
8	Alarm Mask 3	<=8	0 – FFFFFFFF	0
9	High RPM Threshold	<=3	1 – 100(x100 rpm)	30
10	Low RPM Threshold	<=3	0 – 99(x100 rpm)	8
11	CAN Report Expansion Mask	8	0 – FFFFFFFF	001FFFFF
12	Reserved	0		
13	Vehicle Speed High Threshold	<=3	1 – 455Km/h	60
14	Vehicle Speed Low Threshold	<=3	0 – 454Km/h	15
15	Output ID	1	0 – 1	0
16	Output Status	1	0 – 1	0
17	Duration	<=3	0 – 255(×100ms)	0
18	Toggle Times	<=3	0 – 255	0
	Serial Number	4	0000–FFFF	
	Tail Character	1	$	$

- <*Group ID*>: The ID of the CANBUS alarm group. A total of 20 groups are supported.
- <*Mode*>: The CANBUS alarm working mode for each group.
  - 0: Disable the CAN alarm function.
  - 1: Enable the CAN alarm function.
- <*Debounce Time*>: The time for CANBUS alarm trigger event debouncing.
- <*CAN Data Mask*>: Bitwise mask to configure the CAN data composition of the **+RESP:GTCLT** report message.

Mask Bit	Item	Description
Bit 31	Reserved	
Bit 30	Reserved	
Bit 29	*<CAN Report Expansion Mask>*	If this bit is set to 1, the parameter *<CAN Report Expansion Mask>* in **AT+GTCLT** is valid. If this bit is set to 0, the parameter *<CAN Report Expansion Mask>* in **AT+GTCLT** is not valid.
Bit 28	Reserved	
Bit 27	*<Handbrake Applies During Ride Count>*	Counts events when handbrake is pulled-up while driving (speed is greater than 5 km/h).
Bit 26	*<Total Engine Cold Running Time>*	Total driving time with cold engine (engine coolant temperature below 70°C.
Bit 25	*<Engine Starts by Ignition Count>*	Total number of engine starts by ignition.
Bit 24	*<Engine All Starts Count>*	Total number of engine starts.
Bit 23	*<Engine Cold Starts Count>*	Number of cold engine starts.
Bit 22	Reserved	
Bit 21	*<Total Vehicle Engine Overspeed Time>*	The total time when the vehicle engine speed is greater than the limit defined in CAN100 configuration
Bit 20	*<Total Vehicle Overspeed Time>*	The total time when the vehicle speed is greater than the limit defined in CAN100 configuration
Bit 19	*<Doors>*	An 8-bit hexadecimal number. Each bit contains information of one door.
Bit 18	*<Lights>*	An 8-bit hexadecimal number. Each bit contains information of a light.
Bit 17	*<Detailed Information/Indicators>*	A hexadecimal number. Each bit contains information of one indicator.
Bit 16	*<Tachograph Information>*	Two bytes. The higher byte describes driver 2 (the one whose card is inserted in tachograph slot 2), and the lower byte describes driver 1.
Bit 15	*<Axle Weight 2nd>*	Weight of vehicle's second axle
Bit 14	*<Total Idle Fuel Used>*	Number of liters of fuel used since vehicle manufacture or device installation. Total idle fuel or energy used - with vehicle speed 0 km/h.

Bit 13	*<Total Engine Idle Time>*	Time of engine running during idling status (vehicle at a standstill) since vehicle manufacture or device installation
Bit 12	*<Total Driving Time>*	Time of engine running during driving (non-zero speed) since vehicle manufacture or device installation
Bit 11	*<Total Engine Hours>*	Time of engine running since vehicle manufacture or device installation
Bit 10	*<Accelerator Pedal Pressure>*	The pressure applied on acceleration pedal
Bit 9	*<Range>*	The number of kilometers to drive on remaining fuel
Bit 8	*<Fuel Level>*	The level of fuel in vehicle's tank (in Liters or Percentage)
Bit 7	*<Fuel Consumption>*	The fuel consumption of the engine
Bit 6	*<Engine Coolant Temperature>*	The temperature of the engine coolant
Bit 5	*<Engine RPM>*	Revolutions per minute of the engine
Bit 4	*<Vehicle Speed>*	Vehicle road speed
Bit 3	*<Total Fuel Used>*	The number of liters of fuel used since vehicle manufacture or device installation. Total fuel or energy used - read from vehicle.
Bit 2	*<Total Distance>*	Vehicle total distance
Bit 1	*<Ignition Key>*	Ignition status
Bit 0	*<VIN>*	Vehicle identification number

✧ *<Alarm Mask 1>*: Bitwise setting of the alarm mask. The alarm mask information is based on *<Detailed Information / Indicators>* and *<Expansion Information>* of the **+RESP:GTCAN** message. Please see the following alarm mask table.

Note: In the CAN100 firmware versions 2.0.xx and 2.1.xx, the parameter is 16-bit long (Bit 0 – Bit 15), which has been extended to 32 bits since the CAN100 version 2.2.0:

Bit	Alarm Mask 1
Bit 31	Reserved
Bit 30	Reserved
Bit 29	Reserved
Bit 28	OLL – oil level low indicator (1 – on, 0 – off or not available)

Bit 27	SC – service call indicator (1 – on, 0 – off or not available)
Bit 26	AIR – airbags indicator (1 – on, 0 – off or not available)
Bit 25	CHK – “check engine” indicator (1 – on, 0 – off or not available)
Bit 24	ESP – ESP failure indicator (1 – on, 0 – off or not available)
Bit 23	ABS – ABS failure indicator (1 – on, 0 – off or not available)
Bit 22	EH – engine hot indicator (1 – on, 0 – off or not available)
Bit 21	OP – oil pressure indicator (1 – on, 0 – off or not available)
Bit 20	BF – brake system failure indicator (1 – on, 0 – off or not available)
Bit 19	BAT– battery indicator (1 – on, 0 – off or not available)
Bit 18	CLL – coolant level low indicator (1 – on, 0 – off or not available)
Bit 17	BFL – brake fluid low indicator (1 – on, 0 – off or not available)
Bit 16	W – webcast (1 – on, 0 – off or not available)
Bit 15	T – trunk (1 – opened, 0 – closed)
Bit 14	D – doors (1 – any door opened, 0 – all doors closed)
Bit 13	FFL – front fog lights (1 – on, 0 – off)
Bit 12	RFL – rear fog lights (1 – on, 0 – off)
Bit 11	HB – high beams (1 – on, 0 – off)
Bit 10	LB – low beams (1 – on, 0 – off)
Bit 9	RL – running lights (1 – on, 0 – off)
Bit 8	R – reverse gear (1 – on, 0 – off)
Bit 7	CL – central lock (1 – locked, 0 – unlocked)
Bit 6	H – handbrake (1 – pulled-up, 0 – released)
Bit 5	C – clutch pedal (1 – pressed; 0 – released)
Bit 4	B – brake pedal (1 – pressed; 0 – released)
Bit 3	CC – cruise control (1 – active, 0 - disabled)
Bit 2	AC – air conditioning (1 – on, 0 - off)
Bit 1	DS – driver seatbelt indicator (1 – indicator on, 0 – off).
Bit 0	FL – fuel low indicator (1 – indicator on, 0 – off).

✧ <*Alarm Mask 2*>: Bitwise setting of the alarm mask. The alarm mask information is based on <*Lights*> and <*Doors*> of the **+RESP:GTCAN** message. Please see the following alarm mask table.

Bit	Alarm Mask 2
Bit 31	Reserved
Bit 30	Reserved
Bit 29	Reserved
Bit 28	Reserved
Bit 27	Reserved
Bit 26	Reserved
Bit 25	Reserved
Bit 24	Reserved
Bit 23	Reserved
Bit 22	Reserved
Bit 21	Hood (1 – open, 0 – closed)
Bit 20	Trunk (1 – open, 0 – closed)
Bit 19	Rear Right Door (1 – open, 0 – closed)
Bit 18	Rear Left Door (1 – open, 0 – closed)
Bit 17	Passenger Door (1 – open, 0 – closed)
Bit 16	Driver Door (1 – open, 0 – closed)
Bit 15	Reserved
Bit 14	Reserved
Bit 13	Reserved
Bit 12	Reserved
Bit 11	Reserved
Bit 10	Reserved
Bit 9	Reserved
Bit 8	Reserved
Bit 7	Reserved
Bit 6	Reserved
Bit 5	Hazard Lights (1 – on, 0 – off)
Bit 4	Rear Fog Light (1 – on, 0 – off)
Bit 3	Front Fog Light (1 – on, 0 – off)

Bit 2	High Beam (1 – on, 0 – off)
Bit 1	Low Beam (1 – on, 0 – off)
Bit 0	Running Lights (1 – on, 0 – off)

✧ <*Alarm Mask 3*>: Bitwise setting of the alarm mask. The alarm mask information is based on <*Engine RPM*> of the **+RESP:GTCAN** message. Please see the following alarm mask table.

Bit	Alarm Mask 3
Bit 31	Reserved
…	…
Bit 7	Over Vehicle Speed High Threshold Event (1 – Triggered, 0 – not triggered).
Bit 6	Under Vehicle Speed High Threshold Event (1 – Triggered, 0 – not triggered).
Bit 5	Over Vehicle Speed Low Threshold Event (1 – Triggered, 0 – not triggered).
Bit 4	Under Vehicle Speed Low Threshold Event (1 – Triggered, 0 – not triggered).
Bit 3	Over High RPM Event (1 – Triggered, 0 – not triggered).
Bit 2	Under High RPM Event (1 – Triggered, 0 – not triggered).
Bit 1	Over Low RPM Event (1 – Triggered, 0 – not triggered).
Bit 0	Under Low RPM Event (1 – Triggered, 0 – not triggered).

✧ <*High RPM Threshold*>: This is the threshold of the high engine RPM. If the current engine RPM is more than <*High RPM Threshold*>, it will trigger over high RPM event.

✧ <*Low RPM Threshold*>: This is the threshold of the low engine RPM. If the current engine RPM is less than <*Low RPM Threshold*>, it will trigger under low RPM event.

✧ <*CAN Report Expansion Mask*>: Bitwise mask to configure the composition of CANBUS expansion information of the **+RESP:GTCLT** report.

Mask Bit	Item	Description
Bit 31	Reserved	
Bit 30	Reserved	
Bit 29	Reserved	
Bit 28	<*DTC Codes*>	
Bit 27	Reserved	
Bit 26	Reserved	

Bit 25	*<Ambient Temperature>*	
Bit 24	*<Service Distance>*	The parameter describes distance left to diagnostic car review.
Bit 23	*<Engine Torque>*	The engine torque. Unit: Percentage.
Bit 22	*<Rapid Accelerations>*	The number of total rapid accelerations since installation (calculation based on CAN 100 settings of speed increase time and value)
Bit 21	*<Rapid Brakings>*	The number of total rapid brakings since installation (calculation based on CAN 100 settings of speed decrease time and value)
Bit 20	*<Expansion Information>*	A hexadecimal number. Each bit represents information of one indicator.
Bit 19	*<Registration Number>*	The vehicle registration number
Bit 18	*<Tachograph Driver 2 Name>*	The name of tachograph driver 2
Bit 17	*<Tachograph Driver 1 Name>*	The name of tachograph driver 1
Bit 16	*<Tachograph Driver 2 Card Number>*	The card number of tachograph driver 2
Bit 15	*<Tachograph Driver 1 Card Number>*	The card number of tachograph driver 1
Bit 14	*<Total Brake Applications>*	Count of applying brake pedal (braking process initiated by brake pedal)
Bit 13	*<Total Accelerator Kick-down Time>*	Total time when accelerator pedal is pressed over 90%
Bit 12	*<Total Cruise Control Time>*	Total time when the vehicle speed is controlled by cruise-control module
Bit 11	*<Total Effective Engine Speed Time>*	Total time when the vehicle engine speed is effective
Bit 10	*<Total Accelerator Kick-downs>*	Count of accelerator pedal kick-downs (with the pedal pressed over 90%)
Bit 9	*<Pedal Braking Factor>*	It measures how often the driver brakes with brake pedal or with engine and stores both counts (which are always increasing). Decreasing speed with brake pedal pressed causes increase of pedal braking factor.

Bit 8	*<Engine Braking Factor>*	It measures how often the driver brakes with brake pedal or with engine and stores both counts (which are always increasing). Decreasing speed with no pedal pressed causes increase of engine braking factor.
Bit 7	*<Analog Input Value>*	Analog input value
Bit 6	*<Tachograph Driving Direction>*	Vehicle driving direction from tachograph
Bit 5	*<Tachograph Vehicle Motion Signal>*	Vehicle motion signal from tachograph
Bit 4	*<Tachograph Overspeed Signal>*	Tachograph overspeed signal for the vehicle
Bit 3	*<Axle Weight 4th>*	Weight of vehicle's fourth axle
Bit 2	*<Axle Weight 3rd>*	Weight of vehicle's third axle
Bit 1	*<Axle Weight 1st>*	Weight of vehicle's first axle
Bit 0	*<Ad-Blue Level>*	The level of Ad-Blue

✧ *<Vehicle Speed High Threshold>*: This parameter is for high threshold of CANBUS speed alarm. If the current CANBUS speed is higher than or equal to the value of *<Vehicle Speed High Threshold>* and last for *<Debounce Time>*, it will trigger Over Vehicle Speed High Threshold Event. On the contrary, if the current CANBUS speed is lower than *<Vehicle Speed High Threshold>* and last for *<Debounce Time>*, it will trigger Under Vehicle Speed High Threshold Event.

✧ *<Vehicle Speed Low Threshold>*: This parameter is for low threshold of CANBUS speed alarm. If the current CANBUS speed is higher than or equal to the value of *<Vehicle Speed Low Threshold>* and last for *<Debounce Time>*, it will trigger *Over Vehicle Speed Low Threshold Event*. On the contrary, if the current CANBUS speed is lower than *<Vehicle Speed Low Threshold>* and last for *<Debounce Time>*, it will trigger Under Vehicle Speed Low Threshold Event.

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

➢ **+ACK:GTCLT,**

Example: **+ACK:GTCLT,BD0211,135790246811220,,1,000D,20090214093254,FFFF$**			
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''-''_'	

Group ID	<=2	0 – 19	0
Serial Number	4	0000 – FFFF	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

2.2.6.5. CAN100 FOTA Upgrade

The command **AT+GTCFU** is used to upgrade the firmware in CAN100 over the air.

➢ **AT+GTCFU=**

Example: **AT+GTCFU=cv200,0,10,0,,,http://qlinkhf.f3322.org:10086/cv200/deltabin/CL_v2.3.10_sn21008 18_asc.frm,0,0,,,FFFF$**				
SN	**Parameter**	**Length (Byte)**	**Range/Format**	**Default**
1	Password	4 – 20	'0' – '9' 'a' – 'z' 'A' – 'Z'	cv200
2	Retry Times	1	0 – 3	0
3	Timeout	2	10 – 30min	10
4	Protocol Type	1	0|2	0
5	Server User Name	<=6	'0' - '9' 'a' - 'z' 'A' - 'Z' '-' '_'	
6	Server Password	<=6	'0' - '9' 'a' - 'z' 'A' - 'Z' '-' '_'	
7	Server URL	100	Legal URL	
8	Update Type	1	0|1	0
9	Cancel	<=1	0|1	0
10	Reserved	0		
11	Reserved	0		
	Serial Number	4	0000 – FFFF	
	Tail Character	1	$	$

✧ <*Retry Times*>: It specifies the maximum number of retries to download the update package upon download failure.

✧ <*Timeout*>: It specifies the expiration timeout of one download. If the download expires, it is considered to be a failure.

✧ <*Protocol Type*>: The protocol used to download the package.

- 0: HTTP.

- 2: FTP

✧ <*Server User Name*>: If the file server uses authentication, the user name is specified here.

✧ <*Server Password*>: If the file server uses authentication, the password is specified here.

✧ <*Server URL*>: It specifies the URL to download the package.

✧ <*Cancel*>: It indicates whether to cancel the CAN100 upgrade process.

- 0 or empty: Start the CAN100 upgrade process.
- 1: Cancel CAN100 upgrade process.

✧ <*Update Type*>: It specifies the type of CAN100 update over the air.

- 0: CAN100 firmware update.
- 1: CAN100 configuration update.

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

➢ **+ACK:GTCFU,**

Example: **+ACK:GTCFU,BD0211,135790246811220,,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	$	$

2.2.6.6. Transparent Tachograph Transmission

The command **AT+GTTTR** is used to transfer data between the backend server and the terminal. Data to the backend server is wrapped into the message **+RESP:GTTTR** and sent to the backend server.

Before using this command, please use the **AT+GTCAN** command to enable the CAN chip first.

➢ **AT+GTTTR=**

Example: **AT+GTTTR=cv200,0,0001,1,2,20190712000000,20190712235900,,,FFFF$**				
SN	**Parameter**	**Length (Byte)**	**Range/Format**	**Default**
1	Password	4 – 20	'0' – '9' 'a' – 'z' 'A' – 'Z'	cv200

2	Command Type	<=2	0 – 11	
3	TTR Parameters (Optional)	0		
4	Reserved	0		
5	Reserved	0		
	Serial Number	4	0000 – FFFF	
	Tail Character	1	$	$

✧ <*Command Type*>: Command type to indicate which message that server delivers to the device.

- 0: DDD file request. Five reserved parameters are used as follows.

Request ID	4	0000 – FFFF	
Report Mode	1	0|1|2	
Read file type	1	1 – 7	
Start Time	14	YYYYMMDDHHMMSS	
End Time	14	YYYYMMDDHHMMSS	
Segment Mask	1	0 – F	F

- 1: Send authorization APDU to the device.

Sequence number of APDU	4	0000 – FFFF	
APDU DATA	<=512		
Reserved	0		
Reserved	0		
Reserved	0		

- 2: DDD file request cancel. Cancel the older request.
- 3: Debug mode. Read the state of the device. Please do not send this command during the interaction of DDD file.
- 4: To restart TachoReader manually.
- 5: Inquiry Tachograph model.
- 6: Inquiry status of the device.
- 7: Inquiry Tachograph driver 1 ID, name and surname.
- 8: Reserved.
- 9: Reserved.
- 10: Check the current TachoReader connection environment and the device whether ready to download DDD.
- 11: Setting tachograph file format. Two reserved parameters are used as follows.

Tachograph File Format	1	0 – 2	
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		

Note: Please do not issue the query command when requesting DDD file.

- <*Request ID*>: Authorized request's identifier. It is different to set the request each time.
- <*Report Mode*>: It indicates how the DDD file is reported to the end user.
  - 0: Through the message **+RESP:GTTRD**.
  - 1: Through FSO, and the command **AT+GTFSO** should be set.
  - 2: This mode is mostly like <*Report Mode*> 1, the difference is it runs in diagnostic mode. The downloaded file will contain diagnostic data sent to the producer for analysis, not the actual content of the tachograph or driver card file.
- <*Read file Type*>: The DDD file needs to be read.
  - Bit 0: Request to read TACHOGRAPH memory.
  - Bit 1: Request to read driver card in slot 1.
  - Bit 2: Request to read driver card in slot 2.
- <*Start Time*>: Date and time at the beginning of the file to read from Tachograph. The value will transform in Unix Timestamp. If the memory of the Tachograph is not read, the data can be any value. If this parameter is not set, the memory of the Tachograph will be read from the date of the last reading. If this parameter is an invalid value, the memory of the tachograph will be read from the data, when previous read is performed.
- <*End Time*>: Date and time at the end of the file to read from Tachograph. The value will transform in Unix Timestamp. If the memory of the Tachograph is not read, the data can be any value. If this parameter is not set or invalid value, the memory of the Tachograph will be read from the current date.

  Note: If <*Start Time*> and <*End Time*> are set to the future time, the memory of the Tachograph will be read from the date of the last reading.
- <*Segment Mask*>: This parameter is additional markers for reading tachograph memory (<*Read file Type*> bit0 is set 1), excluding certain blocks from download so that the downloaded file size may be smaller.
  - Bit 0: Do not download activities.
  - Bit 1: Do not download errors.
  - Bit 2: Do not download detailed speed.
  - Bit 3: Do not download technical data.
- <*Sequence Number of APDU*>: The serial number of reply APDU, it should keep the same as that sent from the terminal to server.
- <*APDU Data*>: It is the APDU Data for CAN_Logistic. The value is in ASCII Hexadecimal Format.
- <*Tachograph File Format*>: It indicates the file format of tachograph.
  - 0 – DDD (most common European format).
  - 1 – TGD (format required in Spain).

- 2 – V1B/C1B (according to French “Vehicule appendix 1 B”).

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

➢ **+ACK:GTTTR,**

Example: **+ACK:GTTTR,BD0218,867995030082104,,FFFF,20190415091334,0297$**			
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 Type	<=2	0 – 11	
Serial Number	4	0000 – FFFF	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

2.2.6.7. Serial Port Camera Settings

AT+GTCMS is used for setting serial port camera parameters.

➢ **AT+GTCMS=**

Example: **AT+GTCMS=cv200,0,3,5,150,2,1,0003,,,2,1,1,20,,,,,FFFF$**				
SN	**Parameter**	**Length (Byte)**	**Range/Format**	**Default**
1	Password	4 – 20	'0' – '9' 'a' – 'z' 'A' – 'Z'	Cv200
2	Camera ID	1	0-3	
3	Number	<=2	1-10	1
4	Interval	<=2	1-60s	5
5	Photo Compression Ratio	<=3	20-250	150
6	Photo Resolution	1	1-3	2
7	Digital Input ID	1	0-1	0
8	Attribute Mask	<=4	0000 - FFFF	0x0003
9	Server Type	1	0/1	0
10	Reserved	0		

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

- ✧ <Number>: The number of pictures taken in one continuous shooting.
- ✧ <Interval>: The interval between two pictures in one continuous shooting.
- ✧ <Photo Compression Ratio>: The compression ratio of picture. The smaller the compression ratio is, the better the picture quality will be.
- ✧ <Photo Resolution>: The resolution of picture.
  - 1: 160*120
  - 2: 320*240
  - 3: 640*480
- ✧ <Digital Input ID>: The input ID used to trigger photographing.
  - 0: Disable
  - 1: Enable
- ✧ <Attribute Mask>: The <Attribute Mask> in report **+RESP:GTPHL** and **+RESP:GTPHD.**

Bit	Item to Mask
Bit 15	Reserved
⋮	Reserved
Bit 2	Reserved
Bit 1	<Camera ID>
Bit 0	<Photo Time>

- ✧ <Server Type>: The server that the picture is transferred to.
  - 0: Backend server
  - 1: FTP server

Note: The output settings are used to output special waveform when the camera is photographing or trying to photograph and data is being transmitted between camera and CV200 device. And the photograph file name is like **20240208_094303_E0_9.jpg**

The acknowledgment report of the **AT+GTCMS** command:

- **+ACK:GTCMS,**

Example: **+ACK:GTCMS,BD0212,868446036599153,cv200,0989,20190826135246,1783$**			
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	$	$

2.2.6.8. Serial Port Taking Picture in Real Time

AT+GTTAP is used for real-time photographing.

- **AT+GTTAP=**

Example: **AT+GTTAP=cv200,0,,,1,,,,,FFFF$**				
SN	**Parameter**	**Length (Byte)**	**Range/Format**	**Default**
1	Password	4 – 20	'0' – '9' 'a' – 'z' 'A' – 'Z'	cv200
2	Camera ID	1	0-3	0
3	Reserved	0		
4	Reserved	0		
5	Photo Resolution	1	1-3	2
6	Reserved	0		
7	Reserved	0		
8	Reserved	0		
9	Reserved	0		
10	Serial Number	4	0000 – FFFF	
11	Tail Character	1	$	$

Note: When **AT+GTTAP** is used to take pictures, the basic settings of serial port camera such as <Photo Compression Ratio>, <Attribute Mask>, <Output ID>, <Output Status>, <Duration> and <Toggle Times> are the same as **AT+GTCMS** settings.

The acknowledgment report of the **AT+GTTAP** command:

- **+ACK:GTTAP,**

Example: **+ACK:GTTAP,BD0216,868446036599153,cv200,0986,20190826134802,176F$**			
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,,,3,0E-15-15|0F-10-10,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	<=8	00000000 – FFFFFFFF	000000
4	Video Event Mask	<=8	00000000 – FFFFFFFF	6308
5	Record Audio	1	0|1	1
6	Video Quality of Channel 1	1	0|1|2	2
7	Reserved	0		
8	Video Quality of Channel 2	1	0|1|2	2
9	Frame Rate	1	0|4	0
10	Camera Flip	1	0 – F	0
11	Record Channel 2	1	0|1	0

12	Recording Beep	1	0|1	0
13	Picture Upload Mask	<=8	00000000 -FFFFFFFF	000000
14	Video Upload Mask	<=8	00000000 – FFFFFFFF	6308
15	Forced Event Audio Mask	<=8	00000000 – FFFFFFFF	00000000
16	Reserved	0		
17	Recording Time After Ignition Off	<=3	0.5 – 5.0 minutes	3.0
18	Event Recording Duration	<=500	0E-15-15|0F-10-10|…	
	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 channel 1 and channel 2 (When the <Record Channel 2> 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.
- Bit 23: Seatbelt unfastened detection.
- Bit 24: Reserved.
- Bit 25: Reserved.
- Bit 26: Forward Collision Warning detection.
- Bit 27: Pedestrian Collision Warning detection.
- Bit 28: Headway Monitoring Warning 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.
- 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.
- Bit 23: Seatbelt unfastened detection.
- Bit 24: Reserved.
- Bit 25: Reserved.
- Bit 26: Forward Collision Warning detection.
- Bit 27: Pedestrian Collision Warning detection.
- Bit 28: Headway Monitoring Warning detection.

✧ <*Record Audio*>: Turn the audio recording on or off. When turn it on , the audio track will be added into all types of recordings.

- 0: Off.
- 1: On.

✧ *<Video Quality of Channel 1> <Video Quality of Channel 2>*: The quality rate of the video.

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

Note: If ADAS is enabled, the video quality will be set to option 0 forcibly. When ADAS is turned off, the video quality will resume to actual option.

✧ <*Frame Rate*>: The frame rate of the video (channel 1 + channel 2).

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

Note: If ADAS is enabled, the frame rate will be set to option 4 automatically. When ADAS is turned off, the frame rate will resume to actual option.

✧ <Camera Flip>: Bitwise mask, for each bit, set it to 1 to flip the camera up and down.

- Bit 0: Channel 1.
- Bit 1: Channel 2.
- Bit 2 ~ Bit7: Reserved.

✧ <*Record Channel 2*>: 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.
- Bit 23: Seatbelt unfastened detection.
- Bit 24: Reserved.
- Bit 25: Reserved.
- Bit 26: Forward Collision Warning detection.
- Bit 27: Pedestrian Collision Warning detection.
- Bit 28: Headway Monitoring Warning 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.
- 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.
- Bit 23: Seatbelt unfastened detection.
- Bit 24: Reserved.
- Bit 25: Reserved.
- Bit 26: Forward Collision Warning detection.
- Bit 27: Pedestrian Collision Warning detection.
- Bit 28: Headway Monitoring Warning detection.

- <*Event Recording Duration*>: Configure the total duration of event recording, including pre-event and post-event parameters.

  Note: the device records the post-recording if it wakes up from sleep mode, for example in the case of parking safeguard, ignition on and button clicking, only post-event duration will be saved to recordings.

  Note: pre-event + post-event = Duration, Duration > 1 and Duration <= 60, pre-event >= 0 and post-event >= 0.

  The default value of pre-event and post-event is 15.
- <*Forced Event Audio Mask*>: Bitwise mask. It is mostly like the <*Video Upload Mask*>. For each bit, set it to 1 then the audio track will be added into events footage no matter you enable <*Record Audio*> option or not.
- <*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.
- A1: Forward Collision Warning.
- A2: Pedestrian Collision Warning.
- A3: Headway Monitoring Warning.
- 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.
- D8: Seatbelt unfastened detection.

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

- 1: Channel 1.
- 2: Channel 2.

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=cv200,0,1F,0,+,8,0,2,01-01-01-020000,07-01-01-020000,30,,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|2	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 Mode	1	0|2	0
9	OSD Daylight Saving Start Time	<=15	MM-WW-DD-HHMMSS	03-05-01-000000
10	OSD Daylight Saving End Time	<=15	MM-WW-DD-HHMMS	10-05-01-00

			S	0000
11	OSD Daylight Saving Offset	<=3	30|60|90|120(minute)	60
12	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
  - Bit 5: show time offset
- ✧ <GPS Speed Measurement>:
  - 0: kph
  - 1: mph
  - 2: km/h
- ✧ <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 Mode>: Enable/disable daylight saving of OSD time.
  - 0: Disable
  - 2: Week
- ✧ <OSD Daylight Saving Start Time>: The Start Time of DST.
  If <OSD Daylight Saving Mode> = 2, the time format is MM-WW-DD-HHMMSS.
  MM: 1-12Months
  WW: “1 st”, “2 nd”, “3 rd”, “4 th”, “Last week”
  DD: 1 – 7 (Sunday, Monday, …, Saturday)
  HHMMSS: Time (hour, minute, second)
  E.g: “03-02-01-020000”, It indicates second Sunday of March at 2:00
- ✧ <OSD Daylight Saving End Time>: The end time of DST
- ✧ <OSD Daylight Saving Offset>: The offset of DST. (minute)

The acknowledgment message of the **AT+GTOSD** 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|3	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	AWS End Point URL	<=100	URL	
16	Path Format	1	0|1	0
17	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
  - 3: SFTP The default <FTP Server Port> is 22
- <*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

✧ *<AWS End Point URL>*: Specify the AWS End Point URL.

✧ <*Path Format*>: Specify the path format:

- 0: Default Path.
- 1: Remove "Device Name"

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	Channel 1 Picture Resolution	1	0~3	1
5	Channel 1 Compression Quality	1	0|1|2	2
6	Channel 2 Picture Resolution	1	1~3	2
7	Channel 2 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: Channel 1
  - 2: Channel 2
  - 3: Both
- <*Picture Interval*>: Interval between taking pictures (60~3600 s).
- <*Channel 1 Picture Resolution*>: Compression picture resolution.
  - 0: 1920*1080
  - 1: 1280*720
  - 2: 640*360
  - 3: 320*180
- <*Channel 2 Picture Resolution*>: Compression picture resolution.
  - 1: 1280*720
  - 2: 640*360
  - 3: 320*180
- <*Channel 1 Compression Quality*> <*Channel 2 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	Channel 1 Picture Resolution	1	0~3	1
4	Channel 1 Compression Quality	1	0|1|2	2
5	Channel 2 Picture Resolution	1	1~3	2
6	Channel 2 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

- ✧ <*Channel 1 Picture Resolution*>: Compression picture resolution
  - 0: 1920*1080
  - 1: 1280*720
  - 2: 640*360
  - 3: 320*180
- ✧ <*Channel 2 Picture Resolution*>: Compression picture resolution
  - 1: 1280*720
  - 2: 640*360
  - 3: 320*180
- ✧ <*Channel 1 Compression Quality*> <*Channel 2 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|1|4|6|12|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.
- 1: Escort Bluetooth Accessory.
- 4: CAN accessory. Five reserved parameters are used as follows (CAN Chanel Type):

PIN Code	4|6	0000-9999|000000-999999	0000
Reserved			
Reserved			
Reserved			

Reserved			

Note: This accessory type is valid only when the <*Communication Type*> is 1 in the **AT+GTCAN** command.

✧ <*PIN Code*>: The code needs to be input when pairing with accessories.

- 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.

- 12: BLE TPMS sensor.

Reserved			
Tire Pressure Alarm Mode	1	0 – 3	0
Low Tire Pressure	<=2	0 – 500(kpa)	150
High Tire Pressure	<=2	0 – 500(kpa)	300
Validity	<=2	1 – 10 sec	2
Alarm Send Interval	<=5	0 – 86400(Sec)	60
Available Validity Time	<=5	60 – 86400(Sec)	60

The device will report the **+RESP:GTBAA** message to the backend server when the tire pressure keeps meeting alarm conditions.

✧ <*Tire Pressure Alarm Mode*>: The working mode of the tire pressure alarm.

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

✧ <*Low Tire Pressure*>: The lower tire pressure limit.

✧ <*High Tire Pressure*>: The upper tire pressure limit.

✧ <*Validity*>: If the tire pressure keeps meeting the alarm condition for <*Validity*> times, the tire pressure alarm will be triggered.

✧ <*Alarm Send Interval*>: After the <*Validity*> checking, the device will report tire pressure alarm every <*Send Interval*> times of tire pressure reading based on reading timer of tire pressure sensor. If <*Send Interval*> is set to 0, the device will only report the tire pressure alarm once.

✧ <*Available Validity Time*>: If the device does not detect the tire pressure sensor in the <*Available Validity Time*>, the <*Accessory Status*> in the message **+RESP:GTERI** report messages will be 0.

- 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 Escort Bluetooth Accessory (<*Accessory Type*> is 1):
  0: TD_BLE fuel sensor
- The model of for CAN accessory (<*Accessory Type*> is 4):
  0: BLE CAN100
- 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 for TPMS sensor accessory (<*Accessory Type*> is 12):
  0: MLD BLE TPMS (ATP100/ ATP102)
- 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	*<Tire pressure>*	Tire pressure
Bit 10	*<Timestamp>*	Timestamp
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|5	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	Organization Unique Identifier	0|2|4|6	00--FFFFFF	
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	Message Type	1	0|1	
22	Reserved	0		
	Serial Number	4	0000 – FFFF	
	Tail Character	1	$	$

✧ <*Index*>: The index of the beacon Bluetooth accessory. A Beacon ID model can only be bound to one index.

✧ <*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 – F	0
Keyfob Detection Mode	1	0 – 2	0
Keyfob Detection Interval	<=3	30 – 600(Sec)	30
Reserved	0		
Reserved	0		

✧ <*Push Button Event*>: Bitwise mask to configure which event should be triggered when the button on WKF300 is pushed. For each bit, set it to 1 to enable the corresponding trigger event, and 0 to disable the corresponding trigger event.

- Bit0: the device will report the message **+RESP:GTBAA** to backend server.
- Bit1: the device will report the message **+RESP:GTBTN** 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.

5: Standard Beacon. Five reserved parameters are used as follows:

Beacon Type	1	1	0
Beacon Detection Mode	1	0|3	0
Reserved	0		
Beacon Report Interval	<=5	60 - 86400(s)	120
Reserved	0		

✧ <*Scan Beacon Type*>: Scan beacon type.

- 1: Eddystone .

✧ <*Beacon Detection Mode*>: The parameter which specifies the mode of detecting beacon.

- 0: Disable detection.
- 3: Enable detection: Allow the device to scan continuously.

  The **+RESP:GTBID/GTBIE** message is sent to the backend server periodically according to the parameter <Beacon Report Interval>. For **+RESP:GTBID**, if more than 15 beacons are detected, the top 15 will be reported; for **+RESP:GTBIE**, if more than 50 beacons are detected, the message will contain the information of the top 50 beacons.

✧ <*Beacon Report Interval*>: The time interval for sending +RESP:GTBID/GTBIE messages when <Beacon Detection Mode> is 3.

Note: If <Beacon ID Accessory Model> is 5 (Standard Beacon), <MAC List> will be invalid and there is no need to configure it. Up to 50 beacons are supported.

✧ <*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: <Accessory Temperature>.
- 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.

- <*Organization Unique Identifier*>: It is from the Bluetooth MAC address. Only one Organization Unique Identifier (OUI) is allowed for each type of Bluetooth accessory. For example, 'AC0123456789' represents the Bluetooth Beacon MAC. The 'AC' is OUI. If the device detects this OUI, the **+RESP:GTBID/GTBIE** message will be reported. If the value is empty, it means "Disable this function". When <Beacon ID Accessory Model> is 5 (Standard Beacon), this parameter is valid.
- <*Message Type*>: The type of message. If <Beacon ID Accessory Model> is 5 (Standard Beacon), this parameter is valid.
  - 0: Report **+RESP:GTBID** (max 15 devices information will be reported).
  - 1: Report **+RESP:GTBIE** (max 50 devices information will be reported).
- <*Output ID*>: The ID of the output port to output the specified waveshape when the **+RESP:GTBAA** or **+RESP:GTBID/BIE** 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	$	$

2.2.8.4. Primary Stolen Vehicle Recovery

The command **AT+GTSVR** is used to configure the Bluetooth settings for the Primary device. If the Primary device (CV200) cannot connect with the Ghost device within the time defined by <*Connect Interval*> * <*Connect Fail Count*>, it will report the message **+RESP:GTSVR** to the

backend server. When the Primary device connects to the Ghost device for the first time, and meanwhile the Primary matches the Ghost's MAC address, IMEI and UTC time successfully, the Primary device will report the message **+RESP:GTSVR** to the backend server, and the CELL LED will be ON (2 seconds) and OFF (2 seconds) periodically and lasts for 40 seconds.

➢ **AT+GTSVR=**

Example: **AT+GTSVR=cv200,1,780541024888,60,1,863574041277070,1440,,,FFFF$**			
Parameter	**Length (Byte)**	**Range/Format**	**Default**
Password	4 – 20	'0' – '9' 'a' – 'z' 'A' – 'Z'	cv200
Mode	1	0 – 1	0
Ghost MAC Address	12	000000000000 – FFFFFFFFFFFF	
Connect Interval	<=4	10|20|30|60|120|180|240|360|480|720|1440	10
Connect Fail Count	<=2	1 – 10	1
Match Connected IMEI	15	'0' – '9'	
BTI Report Interval	<=4	0 – 1440	0
Reserved	0		
Reserved	0		
Serial Number	4	0000 – FFFF	
Tail Character	1	$	$

✧ <*Mode*>: The working mode of the Primary device's stolen vehicle recovery function.
- 0: Disable this function.
- 1: Enable this function.

✧ <*Ghost MAC Address*>: The MAC address of the Ghost device which is used to pair with the Primary device.

✧ <*Connect Interval*>: The maximum amount of time allowed for the Ghost device to establish a connection with the Primary device. Unit: minute.

Note: The <*Connect Interval*> parameter for the Ghost device should be set to a value less than or equal to the <*Connect Interval*> set for the Primary device.

✧ <*Connect Fail Count*>: The maximum number of connection failures between the Primary device and the Ghost device.

✧ <*Match Connected IMEI*>: The IMEI of the Ghost device which is used to match with the Primary device.

✧ <*BTI Report Interval*>: It specifies the interval for reporting the **+RESP:GTBTI** message regarding the status and Bluetooth information of the Ghost device. 0 means "Disable the

+RESP:GTBTI report". Unit: minute.

Note: If the connection between the Primary device and the Ghost device fails, the message **+RESP:GTBTI** will not be reported.

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

- **+ACK:GTSVR,**

Example: **+ACK:GTSVR,BD0213,135790246811220,,0013,20090214093254,11F0$**			
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	$	$

2.2.9.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=cv200,2,3FFFFFFFFFFFFFF,,,,,,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	3|16-32|8|1|1|1|1|1	"SRI"|00000000000000000000000000000000 – FFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFF|00000000 –	

	Mode/ADAS parameters/CAN100 Operation Mode		FFFFFFFF|0-1|0-2|0-1|0-1|0|0-1	
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.**
- 10: ***CAN***. Get CAN information via report **+RESP:GTCAN**. Only when the CANBUS function is valid.

- 12: ***CVN***. Get the version number information of CAN100 via message **+RESP:GTCVN**. It works only when the CANBUS function is valid.
- 13: ***CSN***. CSN. Get the serial number information of CAN100 via message **+RESP:GTCSN**. It works only when the CANBUS function is valid.
- 14: ***DELBUF***: Delete all the buffered reports.
- ***15: Format TF Card:*** Format the TF card. *<TF Card State>* of **+RESP:GTOSI** will be changed.
- 16: **WFS**. Get the WiFi working state via the message **+RESP:GTWFS**.
- 1E: **BLE**. Command for Bluetooth.
- 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.
- 22: **COP**. ***CAN100 Operation***. It works only when the CANBUS function is valid.
- 23: **CAP**. Request to calibrate the ADAS parameters.
- 24: **CCP**. Request to calibrate the camera position.
- 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.
- 2F: **CQM**. ***CAN Query Mode***. Query the information related to CAN and report them via **+RESP:GTCIF** message. It works only when the CANBUS function is valid.
- 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 75	TLS

Bit 66 ~ 74	Reserved
Bit 65	VVS
Bit 63 ~ 64	Reserved
Bit 62	NTS
Bit 61	PRS
Bit 60	NMD
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	CAN
Bit 45 ~ Bit 43	Reserved
Bit 42	PEO
Bit 41	CMS
Bit 40	CLT
Bit 39	URT
Bit 38	Reserved
Bit 37	SVR
Bit 36	BID
Bit 35	BAS
Bit 34	BTS

Bit 33	Reserved
Bit 32	UPC
Bit 31	ASC
Bit 30	DSS
Bit 29	RMD
Bit 28	Reserved
Bit 27	FFC
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
  3: Delete uploading log file task
- Module Type: Specified module type when <Sub Command> is set to 20/21
  0: DMS
  1: ADAS
  Note: If <Sub Command> = 24, <Module Type> has only one option -- 0:DMS
- CAN Operation Mode: Specified module type when <Sub Command> is set to 22.
  0: Read the current car model and report it via the message **+RESP:GTCML**.
  1: Set car model. Please use the <CAN100 Car Model ID> parameter to set car model.
  2: Start CAN100 automatic synchronization. The synchronization result is reported via the **+RESP:GTCML** message.
  Note: The entire synchronization takes about 10-40s, and CAN100 will restart immediately after the end of the synchronization regardless of the result. If automatic sync is enabled, please wait for the synchronization to finish before reading the current car model. If automatic synchronization has not ended, the subsequent synchronization command will be ignored.
- ADAS parameters: Specified ADAS parameters when <Sub Command> is set to 23
  0: Extrinsic parameter
- 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+GTTLS, 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 BLE (1E):

- 0: "**BTI**". Request the terminal to report the Bluetooth information and paired device via the **+RESP:GTBTI** message.
- 1:"**WUM**". This command is used to wake up Ghost. **Note:** The Primary device cannot wake up Ghost device immediately, and it can wake up Ghost device only when the time Ghost device connects to the Primary device via Bluetooth.

For the sub command DSS (20):

- User Key

For the sub command COP (22) and <CAN Operation Mode> is 1:

- CAN100 Car Model ID

For the sub command CQM (2F):

- If <Sub Command> is set to 2F, configuration information for a specific CAN information mask can be obtained via the message **+RESP:GTCIF**.

  CAN Information Mask Table:

Mask Bit	Item
Bit 7	Reserved for extension
Bit 6	Reserved
Bit 5	Reserved
Bit 4	Reserved
Bit 3	CAN Car Model ID
Bit 2	CAN Car Name
Bit 1	CAN Serial Number
Bit 0	CAN Version Number

For the sub command CAP (23), ADAS extrinsic parameters (0), these parameters are separated by vertical bars ('|'), like this "1|2|3|4|5|6|7":

- Horizon, pixel coordinates of the horizon in images in the real world. Unit: pixel, range: 0 ~ 1080
- Car Middle. Unit: pixel, range: -960 ~ 960.
- Car Width. Unit: cm. positive number.
- Camera Height. Unit: cm. 0 or positive number.
- Camera To Axle. Unit: cm. Both positive and negative numbers and 0 are acceptable.
- Camera To Bumper. Unit: cm. Both positive and negative numbers and 0 are acceptable.
- Camera To Left Wheel. Unit: cm. Both positive and negative numbers and 0 are acceptable.

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$
AT+GTRTO=cv200,38,1,0,20240628020304,15,15,,,FFFF$
AT+GTRTO=cv200,38,2,2,20240813050101,,,10,,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|2	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	Duration	<=2	1 – 10(minute)	1
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.
  - 2: Video duration request.
- <*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: Channel 1
  - 1: Channel 2
  - 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.
- <*Duration*>: If <Query Type> = 2, it specifies time period to search video files (<Video Time> is start time, <Video Time> + <Duration> is end time)

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,1,218.17.46.11:1935/live,video_ch,0,0,,,,,0,10,0,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_name
5	Encoder Key	0< X <=100		
6	Streaming Type	1	0 - 3	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	
13	Pushing Audio	1	0 - 1	0
14	Pushing Timeout	<=3	0 - 999(s)	60
15	Frame Number	1	0	0
	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. (By default, rtmp:// is used without a prefix. If it is rtmps, it must be the full rtmps://..... URL)

✧ <*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: Channel 1
- 1: Channel 2

✧ <*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.
- <Pushing Audio>: if <Streaming Type> = 0, it controls whether to push audio streams
  - 0: Disable
  - 1: Enable
- <Pushing Timeout>: if <Streaming Type> = 0, it automatically disconnects when the time is reached. (If <Pushing Timeout> = 0, no timeout limit.)
- <Frame Number>: if <Streaming Type> = 1|2|3, it controls the push frame number
  - 0: Original frame rate

  Note: During live streaming or playback streaming being pushed, ADAS/DMS object detection will be temporarily suspended and will resume once the streaming actions are completed.

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|1	0
4	Picture Source	<=35		
5	Picture Time	14	YYYYMMDDHHMMSS	
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
- 1: Take picture by time.
  Take picture from video file by time

✧ <*Picture Source*>: If <*Query Type*> = 0, <*Picture Source*> is a file name (e.g: 20211008_110000_F0_1). If <Query Type> = 1, the definitions of <Picture Source> are as follows:

- 0: Channel 1
- 1: Channel 2
- 2: Both

✧ <*Picture Time*>: If <Query Type> = 1, the time of take picture from video file, if <Picture Time> is blank, it will take a picture right now (e.g: 20231114_111213_F2_1.jpg)

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|2	
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: Channel 1
- 1: Channel 2
- 2: Both

✧ <*File Type*>:

- 0: Normal Picture

- 1: Normal Video
- 2: Protected 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.** ("F0", "F1" type excluded)

✧ <*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,BD0200,868487004353181,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	0|4	0XXX	
MNC	0|4	0XXX	
LAC	0|4	XXXX	
Cell ID	0|4|8	XXXX|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: Reboot report for no network watchdog
5: Reboot report for no activation watchdog
6: Reboot report for sending failure timeout watchdog

- 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: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,,,,100,21,0,,,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	0|4	0XXX	
MNC	0|4	0XXX	
LAC	0|4	XXXX	
Cell ID	0|4|8	XXXX|XXXXXXXX	
Position Append Mask	2	00 – FF	00
Satellites in View	<=2	0 – 99	
Satellites in Use	<=2	0 – 99	
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	
Out Status	1	0|1	
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: FRI report frequency change which indicates that the terminal enters into Geo-fence or roaming status
  - 3: Corner report when FRI report frequency changes
  - 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.
- <*Out Status*>: The status of output.
  - 0: Low
  - 1: High
- <Position Append Mask>: Please refer to **AT+GTCFG**.
- <Satellites in View>: If bit 0 of <Position Append Mask> in **AT+GTCFG** is enabled, this part will be showed and it includes the number of visible satellites for the current position.
- <Satellites in Use>: If bit 2 of <Position Append Mask> in **AT+GTCFG** is enabled, this part will be showed and it includes the number of satellites used for the current position.

➢ **+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,,,,0,21,0,,,,,,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	0|4	0XXX	
MNC	0|4	0XXX	
LAC	0|4	XXXX	
Cell ID	0|4|8	XXXX|XXXXXXXX	
Position Append Mask	2	00 – FF	
Satellites in View	0 – 99		
Satellites in Use	0 – 99		
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	
Out Status		1	0|1	
UART Device Type		<=2	0 – 99	
Reserved		0		
Reserved		0		
Bluetooth Accessory Data (Optional)	Bluetooth Accessory Number	<=2	0 – 10	
	Index	1	0 – 9	
	Accessory Type	2	1|6|12|13	
	Accessory Model	1	0 – 5	
	Raw Data (Optional)	<=18		
	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	0		

	(Optional)			
	Reserved3 (Optional)	0		
	Reserved4 (Optional)	0		
	Reserved5 (Optional)	0		
	Tire pressure (Optional)	<=3	0 – 500(kpa)	
	Timestamp (Optional)	14	YYYYMMDDHHMMSS	
	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	
CAN Data (Optional)		<=1000		
Send Time		14	YYYYMMDDHHMMSS	
Count Number		4	0000 – FFFF	
Tail Character		1	$	$

- <*UART Device Type*>: The type of device connected to the second serial port.
  - 0: No device connected
  - 5: CANBUS device
- <*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.
- <*Raw Data*>: The data is read from Bluetooth accessory. It varies depending on <*Accessory Type*> and <*Accessory Model*>.
- <*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.
- <*Timestamp*>: Timestamp of the tire pressure value collection.
- <*Accessory Battery Percentage*>: Percentage of Bluetooth accessory's battery power.
- <*Relay state*>: The current state of the relay sensor.
- <*CAN Data*>: Please refer to the +RESP:GTCAN report. The <CAN Data> contains fields from <*CANBUS Device State*> to <*Drv2 Maximum Daily Driving Time*>. This field can be analyzed as per the +RESP:GTCAN report.
- <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*>.
- <Reserved8>: It is controlled and reported by Bit11 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	0|4	0XXX	
MNC	0|4	0XXX	
LAC	0|4	XXXX	
Cell ID	0|4|8	XXXX|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	XXXX|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	
Earliest Recording Time	<=14	YYYYMMDDHHMMSS	
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.
- <Earliest Recording Time>: The earliest recorded time on the device. (If there is no video file, it will be blank)
- <*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: Channel 1 is connected
  - Bit1: Channel 1 recording is enabled
  - Bit2: Channel 1 recording
  - Bit3: Channel 1 recording by events
  - Bit4: Reserved
  - Bit5: Reserved
  - Bit6: Reserved
  - Bit7: Reserved
  - Bit8: Channel 2 is connected
  - Bit9: Channel 2 recording is enabled
  - Bit10: Channel 2 recording
  - Bit11: Channel 2 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		
Manual Netreg	1	0 – 1	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
RTO Serial Number	<=1	0 - 1	0
Composition Mask	<=4	0 –007F	007F
Power Saving Mode	1	1 – 2	1
Position Append Mask	2	00 – FF	00
Event Mask	4	000000 – FFFFFF	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			
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		
TMA	3	TMA	TMA
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
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		
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		
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
High Speed	<=3	100 – 400km/h	100
Vhb	<=3	0-100km/h	0
Vha	<=3	0-100km/h	0
Medium Speed	<=3	60 – 100km/h	60
Vmb	<=3	0-100km/h	0
Vma	<=3	0-100km/h	0
Vlb	<=3	0-100km/h	0
Vla	<=3	0-100km/h	0
Report Mode	1	0-2	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 - 160	15
High Shock Sensitivity	<=2	Crash Threshold<= (X) <=160	23
Reserved	0		

Sampling Start	1	1	1
Samples Before Crash	4	1-1600	500
Samples After Crash	4	1-1600	500
Report ACC Mode	1	0|1	0
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		
FFC	3	FFC	FFC
Priority	1	0-4	0
Mode	1	0-3	0

FRI Mode	1	0-1	0
FRI IGN Report Interval	<=5	5-86400s	30
Reserved	0		
Reserved	0		
FRI IGF Report Interval	<=5	0|5-86400s	500
Reserved	0		
Corner Report	<=3	0 – 180	0
Reserved	0		
Reserved	0		
RMD	3	RMD	RMD
Mode	1	0|1	0
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Home Operator Start	<=2	1-10	1
Home Operator End	<=2	1-10	1
Home Operator List	<=6*10		
Reserved	0		
Reserved	0		
Roaming Operator Start	<=3	1-100	1
Roaming Operator End	<=3	1-100	1
Roaming Operator List	<=6*100		
Reserved	0		
Reserved	0		
Blacklist Operator Start	<=2	1-20	1
Blacklist Operator End	<=2	1-20	1
Black List Operator	<=6*20		
Reserved	0		
Reserved	0		

Known Roaming Event Mask	<=6	000000 – FFFFFF	3D07
Known Roaming Picture Upload Mask	<=8	0000 – FFFFFFFF	0000
Known Roaming Video Upload Mask	<=8	0000 – FFFFFFFF	6308
Unknown Roaming Event Mask	<=6	000000 – FFFFFF	3D07
Unknown Roaming Picture Upload Mask	<=8	0000 – FFFFFFFF	0000
Unknown Roaming Video Upload Mask	<=8	0000 – FFFFFFFF	6308
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
DSS	3	DSS	DSS
Event ID	<=2	1 – 8, 20 – 22	
Mode	1	0 – 1	0
Trigger Speed	<=3		
Reserved			
Silent Duration	<=3		
Sensitivity Level	1	0 – 2	1
Reserved	0		
Report Enable	1	0 – 1	1
Right Hand Drive Vehicles	1	0 – 1	0
DMS Distract Scope	<=13		-30|30|30|-30
Reserved	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
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|1|4|6|12|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		
Organization Unique Identifier	0|2|4|6	00--FFFFFF	
Output ID	1	0 – 1	0
Output Status	1	0 – 1	0
Duration	<=3	0 – 255(×100ms)	0
Toggle Times	<=3	0 – 255	0
Message Type	1	0|1	
Reserved	0		

SVR	3	SVR	SVR
Mode	1	0 – 1	0
Ghost MAC Address	12	0000000000 – FFFFFFFFFFFF	
Connect Interval	<=4	10|20|30|60|120|180|240 |360|480|720|1440	10
Connect Fail Count	<=2	1 – 10	1
Match Connected IMEI	15	'0' – '9'	
BTI Report Interval	<=4	0 – 1440	0
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		
CLT	3	CLT	CLT
Group ID	<=2	0 – 19	0
Mode	1	0|1	0
Debounce Time	<=3	0 – 255(×1s)	0
CAN Data Mask	8	0 – FFFFFFFF	000FFFFF
Alarm Mask 1	<=8	0 – FFFFFFFF	0
Alarm Mask 2	<=8	0 – FFFFFFFF	0
Alarm Mask 3	<=8	0 – FFFFFFFF	0
High RPM Threshold	<=3	1 – 100(x100 rpm)	30
Low RPM Threshold	<=3	0 – 99(x100 rpm)	8
CAN Report Expansion	8	0 – FFFFFFFF	001FFFFF

Mask			
Reserved	0		
Vehicle Speed High Threshold	<=3	1 – 455Km/h	60
Vehicle Speed Low Threshold	<=3	0 – 454Km/h	15
Output ID	1	0 – 1	0
Output Status	1	0 – 1	0
Duration	<=3	0 – 255(×100ms)	0
Toggle Times	<=3	0 – 255	0
CMS	3	CMS	CMS
Camera ID	1	0-3	
Number	<=2	1-10	1
Interval	<=2	1-60s	5
Photo Compression Ratio	<=3	20-250	150
Photo Resolution	1	1-3	2
Digital Input ID	1	0-1	0
Attribute Mask	<=4	0000 - FFFF	0x0003
Server Type	1	0/1	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		
Reserved	0		
Reserved	0		
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		
CAN	3	CAN	CAN
Mode	1	0|1	0
CAN Report Interval	<=5	0|5 – 86400sec	0
CAN Report Interval IGF	<=5	0|5 – 86400sec	0
CAN Report Mask	8	0 – FFFFFFFF	C00FFFFF
Additional Event	1	0|1	0
Communication Type	1	0|1	0
CAN Report Expansion Mask	8	0 – FFFFFFFF	001FFFFF
Reserved	0		
Electric Report Mask	<=8	00000000 - FFFFFFFF	C0
PPC	3	PPC	PPC
Mode	1	0|1	0
Channel 1 Picture Resolution	1	0~3	1

Channel 1 Compression Quality	1	0|1|2	2
Channel 2 Picture Resolution	1	1~3	2
Channel 2 Compression Quality	1	0|1|2	2
Reserved	0		
Reserved	0		
Reserved	0		
REC	3	REC	REC
Record Mode	1	0|1	1
Picture Event Mask	<=8	00000000 - FFFFFFFF	0000
Video Event Mask	<=8	00000000 – FFFFFFFF	6388
Record Audio	1	0|1	1
Video Quality of Channel 1	1	0|1|2	2
Reserved	0		
Video Quality of Channel 2	1	0|1|2	2
Frame Rate	1	0|4	0
Camera Flip	1	0 - F	0
Record Channel 2	1	0|1	0
Recording Beep	1	0|1	0
Picture Upload Mask	<=8	00000000 - FFFFFFFF	0000
Video Upload Mask	<=8	00000000 – FFFFFFFF	6388
Forced Event Audio Mask	<=8	00000000 – FFFFFFFF	00000000
Event Recording Time	=2	10 - 60 seconds	30
Recording Time after Ignition Off	<=3	0.5 – 5.0 minutes	3.0
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|3	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
AWS End Point URL	<=100	URL	
Path Format	1	0|1	0
VMS	3	VMS	VMS
Virtual Ignition Mode	1	0|1|2	0
Detect Virtual Ignition On Duration	2	5 - 60	60
Detect Virtual Ignition Off Duration	3	60 - 600	300
Reserved	0		
Reserved	0		
VVS	3	VVS	VVS

Ignition On Voltage	<=5	250 - 28000(mV)	13500
Voltage Offset	<=4	200 - 2000(mV)	600
Ignition On Debounce	<=3	5 – 255(x2s)	10
Smart Voltage Adjustment	1	0 | 1	1
Ignition Off Debounce	<=3	5 – 255(x2s)	10
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
Output1 Status	1	0 – 1	0
Duration	<=3	0 – 255(×100ms)	0
Toggle Times	<=3	0 – 255	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		
Reserved	0		
Long Operation1	<=3	0 – 120min	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	<=6	000000-FFFFFF	3FF
Voice Option	<=2	0|1|7|8	0
Ring Alerts Mask	<=6	000000-FFFFFF	3
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	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|2	0
OSD Sign	1	+|-	+
OSD Hour Offset	<=2	0 - 12	0
OSD Minute Offset	<=2	0 - 59	0
OSD Daylight Saving Mode	1	0|2	0
OSD Daylight Saving Start Time	<=15	MM-WW-DD-HHMMSS	03-05-01-000000
OSD Daylight Saving End Time	<=15	MM-WW-DD-HHMMSS	10-05-01-000000
OSD Daylight Saving Offset	<=3	30|60|90|120(minute)	60
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		
NMD	3	NMD	NMD
Reserved	0		
Non-movement Duration	<=3	1 - 255 (* 15sec)	2
Movement Duration	<=2	2 - 50 (* 100ms)	3
Movement Threshold	1	2 - 9	4
Reserved	0		
Reserved	0		

Reserved	0		
Reserved	0		
Reserved	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
Channel 1 Picture Resolution	1	0~3	1
Channel 1 Compression Quality	1	0|1|2	2
Channel 2 Picture Resolution	1	1~3	2
Channel 2 Compression Quality	1	0|1|2	2
Upload By FTP	1	0|1	0
Reserved	0		
Send Time	14	YYYYMMDDHHMMSS	
NTS	3	NTS	NTS
Enable	1	0|1	0
Reserved	0		
Reserved	0		
Allowed Oper1	10		
Allowed Oper2	10		
Allowed Oper3	10		
Reserved	0		
Blocked Oper1	10		
Blocked Oper2	10		
Blocked Oper3	10		

Reserved	0		
Count Number	4	0000 – FFFF	
Tail Character	1	$	$
TLS	3	TLS	TLS
Server ID	1	0	0
Mode	1	0|1	0
Certificate Verification	1	0 – 2	0
Reserved	0		
Reserved	0		

✧ <*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

In the cases of:

1. When the device establishes the connection with server.
   *Under TCP long connection mode, when the socket connection is established to the server.
   *Under TCP short connection mode, when server/port is detected to change.
   *Under UDP connection mode, when the device releases and re-creates the message handler once SACK check fails.
2. When the system date/time of device are switched according to DST (daylight saving) schedule.
3. When user operates the parameters of OSD (on-screen display).
4. When the device receives RTO-TMZ command from server side.

It will send the time-zone setting 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	XXXX|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,,1,0.00,0.00,0.00,0.00,0.00,0.00,0.00,0.00,0.00,20210315165355,24C9$**			
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,BD0211,864281043112169,cv200,100,20231026_025159_00_1_0016,0016,20231026030755,295E$			
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		
Serial Number	4	0000 - FFFF	
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 | 110 | 120. The query command is confirmed by the device.
- 1X1: Such as 101 | 111 | 121. The query command is refused by the device.
- 1X2: Such as 102 |112 | 122. Other query command is running. Please try again later
- 2X0: Such as 200 | 210 | 220. The device has prepared the specified file.
- 2X1: Such as 201 | 211 | 221. The device cannot prepare the specified file.
- 3X0: Such as 300 | 310 | 320. The device starts to upload file.
- 3X1: Such as 301 | 311 | 321. The device finishes to upload file.
- 3X2: Such as 302 | 312 | 322. The device fails to upload file.
- 3X3: Such as 303 | 313 | 323. The device suspends to upload file.

Note: X means <*Query Type*>.

- 0: File name query.
- 1: Time range query.
- 2: Video duration request.

✧ <*Video Source*>: it indicates the video file uploaded to media server. For example: **20211008_110000_F0_1_FFFF** (extended name not attached). (FFFF is the RTO-VDO command Serial Number)

✧ <*Serial Number*>: If <RTO Serial Number> in AT+GTCFG is enabled, this parameter will be attached to the +RESP:GTSOD, +RESP:GTVDO, +RESP:GTPIC and +RESP:GTRFQ.

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,BD0211,864281043112169,cv200,110,20231026_025159_00_1_0017,0017,20231026030904,2963$**			
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		
Serial Number	4	0000 - FFFF	
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: Failed to open the camera push stream
  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)
  1X9: Failed to open the file push stream
  1XA: Illegal camera ID
  1XB: File placeholder failed
  1XC: Interior camera not exist when open push stream
- 2X0: Close streaming successfully
  2X1: Close streaming failed
  2X2: Failed to close the camera push stream
  2X3: File not exist (Only <Streaming Type> = 1)
  2X4: System is busy, try again later
  2X5: Run out of reconnects
  2X6: Failed to close the file push stream
  2X7: Interior camera not exist when close push stream
- 3X1: An undeclared error interrupts the stream
  Note: X means <Streaming type>

✧ <*Video Source*>: if <Streaming Type> = 0, it indicates the live streaming of channel 1 or channel 2 to be requested. If <Streaming Type> = 1 or 2, it indicates the video file uploaded to media server. For example: **20211008_110000_00_1_FFFF** (extended name not attached). (FFFF is the RTO-SOD command Serial Number)

✧ <*Serial Number*>: If <RTO Serial Number> in AT+GTCFG is enabled, this parameter will be attached to the +RESP:GTSOD, +RESP:GTVDO, +RESP:GTPIC and +RESP:GTRFQ.

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,BD0211,864281043112169,cv200,100,20231025_032907_03_1_0014,,,,,,,0014,2

0231026030626,294F$			
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		
Serial Number	4	0000 - FFFF	
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.
  - 2X2: Upload picture suspends.

  Note: X means <*Query Type*>.
  - 0: File name query.
  - 1: Take picture by time.
- <*Picture Source*>: It indicates the picture file uploaded to media server. For example: **20211008_110000_F0_1_0001** (extended name not attached). (0001 is the RTO-PIC command Serial Number).
- <*Serial Number*>: If <RTO Serial Number> in AT+GTCFG is enabled, this parameter will be attached to the +RESP:GTSOD, +RESP:GTVDO, +RESP:GTPIC and +RESP:GTRFQ

2.3.3.16. +RESP:GTRFQ

➢ **+RESP:GTRFQ**

Example: **+RESP:GTRFQ,BD0211,864281043112169,cv200,5,1,1,20231026_025559_00_1.mp4-23522,20231026_025659_00_1.mp4-23571,20231026_025759_00_1.mp4-23505,20231026_025859_00_1.mp4-23643,20231026_025959_00_1.mp4-23096,0020,20231026031020,2973$**			
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	<=3	0-999	
Frame Number	<=3	0-999	
Record N	<32	e.g: 20211120_150943_01_2.jpg -20	
Serial Number	4	0000 - FFFF	
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. (in decimal)
✧ <*Total Frame*>: The total pages of result. (in decimal)
✧ <*Frame Number*>: The current number of pages. (in decimal)
✧ <*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.
✧ <*Serial Number*>: If <RTO Serial Number> in AT+GTCFG is enabled, this parameter will be attached to the +RESP:GTSOD, +RESP:GTVDO, +RESP:GTPIC and +RESP:GTRFQ.

2.3.3.17. +RESP:GTCSN

After the device receives the command **AT+GTRTO** to get the serial number of the CAN100, it will send the information to the backend server via the message **+RESP:GTCSN**.

➢ **+RESP:GTCSN,**

Example: +RESP:GTCSN,BD0211,865585040277810,,2100054,,,,,20200519065758,18EE$			
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', '-', '_'	
CAN100 Serial Number	<=10	'0' – '9', 'a' – 'z'	
Reserved			
Reserved			
Reserved			
Reserved			
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	(HEX)	
Tail Character	1	$	$

✧ <*CAN100 Serial Number*>: The serial number of the CAN100 device.

2.3.3.18. +RESP:GTCVN

After the device receives the command **AT+GTRTO** to get the version number of the CAN100, it will send the information to the backend server via the message **+RESP:GTCVN**.

➢ **+RESP:GTCVN,**

Example: +RESP:GTCVN,BD0211,869158008709145,CV200,2.2.1d,,,,,20150323013841,2166$			
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' '-' '_'	
CAN100 SW Version	<=7	'0' – '9' 'a' – 'z' '.' '()'	
Reserved			
Reserved			
Reserved			

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

✧ <*CAN100 SW Version*>: The SW version of the CAN100 device.

2.3.3.19. +RESP:GTCML

After the device receives the command **AT+GTRTO** to get the car model ID of the CAN100, it will send the information to the backend server via the message **+RESP:GTCML**.

➢ **+RESP:GTCML,**

Example: **+RESP:GTCML,BD0211,866775050904473,CV200-4473,25,sync,,,,20220901152726,1400$**			
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' '-' '_'	
CAN100 Car Model ID	<=5	0 – 65535	
CAN100 Car Name	<=50	'0' – '9' 'a' – 'z'	
CAN100 Sync Status	1	1 – 4	
Reserved			
Reserved			
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

✧ <*CAN100 Car Model ID*>: The car model ID of the CAN100 device. If the value is 0, it means that no model has been obtained.

✧ <*CAN100 Car Name*>: Car name is human readable make and model of the car. If this string value is equal to "sync", then the <*CAN100 Car Model ID*> of the query is a class ID that has been synchronized.

✧ <*CAN100 Sync Status*>: The CAN100 synchronization status.

- 1: The synchronization is successful.
- 2: CAN100 is not properly connected to the CAN bus.
- 3: The car is not supported by the firmware version of CAN100.

- 4: CAN100 is not responding.

2.3.3.20. +RESP:GTCIF

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

➢ **+RESP:GTCIF,**

Example: +RESP:GTCIF,BD0211,866775051510204,CV200,F,2.3.10e,2100779,OpelAstraH(04-),15,,20220831134840,E116$			
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' '-' '_'	
CAN Information Mask	<=2	0 - FF	
CAN Version Number(optional)	<=7	'0' – '9' 'a' – 'z'	
CAN Serial Number(optional)	<=10	'0' – '9' 'a' – 'z'	
CAN Car Name(optional)	<=50	'0' – '9' 'a' – 'z'	
CAN Car Model ID(optional)	<=5	0 – 65535	
Reserved			
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

✧ <*CAN Information Mask*>: configuration information for a specific CAN information mask can be obtained.
✧ <*CAN Version Number*>: The SW version of the CAN device.
✧ <*CAN Serial Number*>: The Serial Number of the CAN device.
✧ <*CAN Car Name*>: Car name is human readable make and model of the car.
✧ <CAN Car Model ID>: The car model ID of the CAN device. If the value is 0, it means that no models have been obtained.

2.3.3.21. +RESP:GTBTI

After the device receives the command **AT+GTRTO** to get the Bluetooth peripheral information and the list of connected peripherals, it will send the information to the backend server via the message **+RESP:GTBTI**. If the connection between the Primary device and the Ghost device is successful, the battery percentage of the Ghost device will be reported periodically via the message **+RESP:GTBTI** according to the <*BTI Report Interval*> in **AT+GTSVR**.

➢ **+RESP:GTBTI,**

Example: **+RESP:GTBTI,BD0213,866775051515393,CV200,CV200_BT,B908A4800DB1,1,2,,780541217821,0,CAN,F7E776096185,1,0,45,2000,,,,,,20220901193316,2AE0$**			
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' '-' '_'	
Bluetooth Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Bluetooth Mac Address	12	000000000000 – FFFFFFFFFFFF	
Bluetooth State	1	0|1	
Connected Device Number	<=2	0 – 11	
Connected Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Connected Device Mac	12	000000000000 – FFFFFFFFFFFF	
Role	1	0|1	
Real-Time State	1	0 – 1	
Ghost Battery Percentage	3	0 – 100	
Ghost Status	4	0000 – FFFF	
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		

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

- <*Bluetooth State*>: The connection status of the Bluetooth when the CV200 role is the slave.
  - 0: The Bluetooth is not connected.
  - 1: The Bluetooth is connected.
- <*Connected Device Number*>: The number of the connected peripheral device. If there is more than one device connected, the information for the parameters <Connected Device Name>, <Connected Device MAC> and <Role> will be displayed repeatedly.
- <*Connected Device Name*>: The name of the connected peripheral device.
- <*Connected Device Mac*>: The Mac address of the connected peripheral device.
- <*Role*>: The role type of the peripheral device.
  - 0: Master
  - 1: Slave

Note: The <*Connected Device Name*> will be empty if CV200 is the slave.

- <*Real-Time State*>: For the Ghost device, it indicates whether the data for <*Ghost Battery Percentage*> and <*Ghost Status*> read from the Ghost device is real time data or historical data. 0 indicates “historical data”, and 1 indicates “real-time data”.
- <*Ghost Battery Percentage*>: The current volume of the backup battery in percentage.
- <*Ghost Status*>: Bitwise mask to define status of the Ghost device. 0 indicates “The corresponding abnormal status is not detected”, and 1 indicates “The corresponding abnormal status is detected”. For specific details of each bit, please see below.
  - Bit 0: Reserved
  - Bit 1: GNSS fix failure
  - Bit 2: Detected fake cell
  - Bit 3: Battery low warning
  - Bit 4: Fail to get RTC time
  - Bit 5: SIM card error
  - Bit 6: GSM unavailable
  - Bit 7: GPRS unavailable
  - Bit 8: Fail to connect to the backend server
  - Bit 9 – Bit 14: Reserved
  - Bit 15: Communication error between MCU and BB.

Note: The parameters <*Real-Time State*>, <*Ghost Battery Percentage*> and <*Ghost Status*> are empty if <*Mode*> in the command **AT+GTSVR** is 0.

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 (Or voltage below 8V)
+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
+RESP:GTCLT: CANBUS information alarm
+RESP:GTRMD: The report for entering or leaving network roaming state
+RESP:GTSVR: Stolen Vehicle Recovery alarm.
+RESP:GTPHL: Reporting location information before reporting photo data.
+RESP:GTHBM: If harsh behavior is detected, this message will be sent to the backend server.
+RESP:GTHBE: If harsh behavior is detected, and <Report Mode> =1|2, 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.
+RESP:GTRTP: Report file transfer information.

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

➢ **+RESP:GTSTT,**

Example: **+RESP:GTSTT,BD0200,868487004353181,cv200,21,50,0.0,0,264.1,114.015515,22.537178,2021**

0608065450,0454,0003,7C38,000992C5,,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	0|4	0XXX	
MNC	0|4	0XXX	
LAC	0|4	XXXX	
Cell ID	0|4|8	XXXX|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	0|4	0XXX	
MNC	0|4	0XXX	
LAC	0|4	XXXX	
Cell ID	0|4|8	XXXX|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	0|4	0XXX	
MNC	0|4	0XXX	
LAC	0|4	XXXX	
Cell ID	0|4|8	XXXX|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	0|4	0XXX	
MNC	0|4	0XXX	

LAC	0|4	XXXX	
Cell ID	0|4|8	XXXX|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	0|4	0XXX	
MNC	0|4	0XXX	
LAC	0|4	XXXX	
Cell ID	0|4|8	XXXX|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,,202106071021 47,26D4$

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	0|4	0XXX	
MNC1	0|4	0XXX	
LAC1	0|4	XXXX	
Cell ID1	0|4|8	XXXX|XXXXXXXX	
RX Level1	2	0-63	
Reserved	0		
MCC2	0|4	0XXX	
MNC2	0|4	0XXX	
LAC2	0|4	XXXX	
Cell ID2	0|4|8	XXXX|XXXXXXXX	
RX Level2	2	0-63	
Reserved	0		
MCC3	0|4	0XXX	
MNC3	0|4	0XXX	
LAC3	0|4	XXXX	
Cell ID3	0|4|8	XXXX|XXXXXXXX	

RX Level3	2	0-63	
Reserved	0		
MCC4	0|4	0XXX	
MNC4	0|4	0XXX	
LAC4	0|4	XXXX	
Cell ID4	0|4|8	XXXX|XXXXXXXX	
RX Level4	2	0-63	
Reserved	0		
MCC5	0|4	0XXX	
MNC5	0|4	0XXX	
LAC5	0|4	XXXX	
Cell ID5	0|4|8	XXXX|XXXXXXXX	
RX Level5	2	0-63	
Reserved	0		
MCC6	0|4	0XXX	
MNC6	0|4	0XXX	
LAC6	0|4	XXXX	
Cell ID6	0|4|8	XXXX|XXXXXXXX	
RX Level6	2	0-63	
Reserved	0		
MCC	0|4	0XXX	
MNC	0|4	0XXX	
LAC	0|4	XXXX	
Cell ID	0|4|8	XXXX|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	0|4	0XXX	
MNC	0|4	0XXX	
LAC	0|4	XXXX	
Cell ID	0|4|8	XXXX|XXXXXXXX	
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	0|4	0XXX	
MNC	0|4	0XXX	
LAC	0|4	XXXX	
Cell ID	0|4|8	XXXX|XXXXXXXX	
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	0|4	0XXX	
MNC	0|4	0XXX	
LAC	0|4	XXXX	
Cell ID	0|4|8	XXXX|XXXXXXXX	
Reserved	0		
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	0|4	0XXX	
MNC	0|4	0XXX	
LAC	0|4	XXXX	
Cell ID	0|4|8	XXXX|XXXXXXXX	
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	0|4	0XXX	
MNC	0|4	0XXX	
LAC	0|4	XXXX	
Cell ID	0|4|8	XXXX|XXXXXXXX	
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	0|4	0XXX	
MNC	0|4	0XXX	
LAC	0|4	XXXX	
Cell ID	0|4|8	XXXX|XXXXXXXX	
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: Channel 1 is normal
- 301: Channel 1 is faulty
- 400: Channel 2 is normal
- 401: Channel 2 is faulty
- 402: Channel 2 is removed
- 403:Channel 2 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	1|2|3	
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	0|4	0XXX	
MNC	0|4	0XXX	
LAC	0|4	XXXX	
Cell ID	0|4|8	XXXX|XXXXXXXX	
Reserved	0		
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

✧ *<Upload State>: The upload state.*

- 1: FTP/AWS upload is finished
- 2: FTP/AWS upload fails
- 3: FTP/AWS upload suspends

✧ *< 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	<=2	1 – 8, 20 – 22	
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	0|4	0XXX	
MNC	0|4	0XXX	
LAC	0|4	XXXX	
Cell ID	0|4|8	XXXX|XXXXXXXX	
Reserved	0		
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,BD0216,864281043116186,CV200,1,1,1,0,,,,20240220093741,20240711110053,,,,,20240711110057,0080$

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	1-2	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*
  - *2: ADAS*
- <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	0|4	0XXX	
MNC	0|4	0XXX	
LAC	0|4	XXXX	
Cell ID	0|4|8	XXXX|XXXXXXXX	
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	0|4	0XXX	
MNC	0|4	0XXX	
LAC	0|4	XXXX	
Cell ID	0|4|8	XXXX|XXXXXXXX	
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|1|3|6|12|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	<=3	-40 - 80(℃)	

(Optional)			
Accessory Humidity (Optional)	<=3	0 - 100%(rh)	
Reserved1 (Optional)	0		
Reserved2 (Optional)	0		
Tire pressure (Optional)	<=3	0 – 500 (kpa)	
Timestamp (Optional)	14	YYYYMMDDHHMMSS	
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	0|4	0XXX	
MNC	0|4	0XXX	
LAC	0|4	XXXX	
Cell ID	0|4|8	XXXX|XXXXXXXX	
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
- 1: Escort sensor
- 3: Bluetooth beacon accessory
- 6: Multi-Functional beacon sensor
- 12: BLE TPMS 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.
- 0E: Tire pressure alarm: The current Tire pressure value is below <*Low Tire pressure*> set in the **AT+GTBAS** command.
- 0F: Tire pressure alarm: The current Tire pressure value is above <*High Tire pressure*> set in the **AT+GTBAS** command.
- 10: Tire pressure alarm: The current tire pressure value is within the range defined by <*Low Tire pressure*> and <*High Tire pressure*> 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 9: <*Tire pressure*>
- Bit 10: <*Timestamp*>
- Bit 11 ~ 12: 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.

✧ <*Timestamp*>: Timestamp of the tire pressure value collection.

✧ <*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*>.

✧ <Reserved5>: It is controlled and reported by Bit11 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,,,27,1,0.0,339,114.5,113.947930,22.573545,20230725112736,0460,0001,253E,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 – 15	
Beacon ID Model	1	0|5	
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		
Accessory Temperature (Optional)	<=6	-40.00 - 80.00(℃)|-128.00	
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	0|4	0XXX	
MNC	0|4	0XXX	
LAC	0|4	XXXX	
Cell ID	0|4|8	XXXX|XXXXXXXX	
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: <*Accessory Temperature*>
- 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, empty means invalid

✧ <*Accessory Signal Strength*>: The signal strength of Bluetooth accessory.

✧ <Reserved1 ~ 2>: It is controlled and reported by Bit7 of the <*Accessory Append Mask*>.

✧ <*Accessory Temperature*>*:* Temperature data of Bluetooth beacon accessory,
Example, 0x1B8F means 27.56°C (0x1B=27; 0x8F=143, 143/256=0.55), empty means invalid.

➢ **+RESP:GTBIE**

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

Example:
+RESP:GTBIE,BD0217,869409067446545,CV200,1,1,1,14,5,005A,7805413F17D1,,-98,,5,005A,78054111C087,,-98,,5,005A,780541256A39,,-90,,5,005A,7805413F17BF,,-88,,5,005A,7805413F1783,,-87,,5,005A,780541256C41,,-84,,5,005A,780541251EEE,2646,-82,26.81,5,005A,7805413F1763,,-82,,5,005A,78054111C060,,-81,,5,005A,78054102C2C1,,-79,,5,005A,78054111C088,,-73,,5,005A,7805413AACDC,,-72,,5,005A,7805412CCC53,,-67,,5,005A,7805413AAD8C,,-66,,1,0.0,128,114.2,113.947910,22.573573,20240925034320,,,,,,20240925034320,01C3$

Parameter	Length (Byte)	Range/Format	Default
Protocol Version	6	(HEX)	
Unique ID	15	(IMEI)	
Device Name	<=20	'0' - '9', 'a' - 'z', 'A' - 'Z', '-', '_'	
Detected Count	<=3	0 - 9999	
Total Frame	1	1 - 2	
Frame Index	1	1 - 2	
Beacon Number	<=2	0 - 25	
Beacon ID Accessory	1	0|5	

Model			
Accessory Append Mask	4	(HEX)	
Accessory MAC	12	(HEX)	
Accessory Battery Level	<=4	0 - 5000(mV)	
Accessory Signal Strength	<=4	-120 - 0	
Accessory Temperature	<=6	-40.00 - 80.00(℃)|-128.00	
GPS Accuracy	<=3	0 – 255	
Speed	<=5	0.0 - 999.9(km/h)	
Azimuth	<=3	0 - 359	
Altitude	<=8	(-)XXXXX.X(m)	
Longitude	<=11	-180.000000 - 180.000000	
Latitude	<=10	-90.000000 - 90.000000	
GPS UTC Time	14	YYYYMMDDHHMMSS	
MCC	0|4	0XXX	
MNC	0|4	0XXX	
LAC	0|4	XXXX	
Cell ID	0|4|8	XXXX|XXXXXXXX	
Reserved	0		
Reserved	0		
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	(HEX)	
Tail Character	1	$	$

- *<Detected Count>*: The value to indicate the sequence number of beacons have been detected. It will start from 0 when it is over 9999.
- *<Total Frame>*: A numeral to indicate the total number of frames that the following data takes up.
- *<Frame Index>*: A numeral to indicate the index of the current frame.
- *<Beacon Number>*: The number of the Bluetooth beacon accessories.
- *<Beacon ID* Accessory *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.
- *<Accessory MAC>:* The MAC address of the Bluetooth beacon accessory.
- *<Accessory Battery Level>:* The battery voltage of the Bluetooth beacon accessory, empty

means invalid.

- ✧ *<Accessory Signal Strength>:* The signal strength of the Bluetooth beacon accessory. If the value of the signal strength is negative, it is represented in 2's complement format.
- ✧ *<Accessory Temperature>:* Temperature data of Bluetooth beacon accessory,
  Example, 0x1B8F means 27.56°C (0x1B=27; 0x8F=143, 143/256=0.55), empty means invalid.

If the CANBUS Alarm report function is enabled by the command **AT+GTCLT**, *<Alarm Mask 1>*, *<Alarm Mask 2>* and *<Alarm Mask 3>* meet each trigger condition at the same time, and the trigger event duration time is longer than *<Debounce Time>*, the **+RESP:GTCLT** alarm message will be sent.

- ➢ **+RESP:GTCLT,**

Example: **+RESP:GTCLT,BD0211,866775050904382,CV200,18,00000000,00000000,00000011,,,FFFFF,,,H21592,,,,,,,,,,,,,,,,,,0,,,1,0.0,349,102.0,113.947903,22.573573,20240621090744,0460,0011,691D,0DD2CC03,01,0,20220831102914,0872$**			
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''-'' _'	
Group ID	<=2	0 – 19	
Alarm Mask 1	<=8	0 – FFFFFFFF	
Alarm Mask 2	<=8	0 – FFFFFFFF	
Alarm Mask 3	<=8	0 – FFFFFFFF	
Reserved	0		
Reserved	0		
CANBUS Data Mask	<=8	0 - FFFFFFFF	
VIN	17	'0' - '9''A' - 'Z' except 'I', 'O', 'Q'	
Ignition Key	1	0|1|2	
Total Distance	<=12	H(0 – 99999999)/I(0 –2147483647)	
Total Fuel Used	<=9	0.00 –999999.99L	
Engine RPM	<=5	0 – 16383 rpm	
Vehicle Speed	<=3	0 - 455Km/h	
Engine Coolant	<=4	-40 – +215 ℃	

Temperature			
Fuel Consumption	<=6	L/100km(0.0–999.9)|L/H(0.0–999.9)	
Fuel Level	<=8	L(0.00–9999.99)/P(0.00 – 100.00)	
Range	<=8	0 – 99999999	
Accelerator Pedal Pressure	<=3	0 – 100%	
Total Engine Hours	<=10	0.00 – 9999999.99h	
Total Driving Time	<=10	0.00 – 9999999.99h	
Total Engine Idle Time	<=10	0 .00 – 9999999.99h	
Total Idle Fuel Used	<=9	0.00 – 999999.99L	
Axle Weight 2nd	<=5	0 – 65535kg	
Tachograph Information	<=4	00 – FFFF	
Detailed Information / Indicators	<=4	00 – FFFF	
Lights	<=2	0 – FF	
Doors	<=2	0 – FF	
Total Vehicle Overspeed Time	<=10	0.00 – 9999999.99h	
Total Vehicle Engine Overspeed Time	<=10	0.00 – 9999999.99h	
Engine Cold Starts Count	<=8	0 – 16449535	
Engine All Starts Count	<=8	0 – 16449535	
Engine Starts by Ignition Count	<=8	0 – 16449535	
Total Engine Cold Running Time	<=9	0 – 421108120s	
Handbrake Applies During Ride Count	<=5	0 – 64255	
CAN Report Expansion Mask	<=8	0 - FFFFFFFF	
Ad-Blue Level	<=8	L(0.00–9999.99)/P(0.00 – 100.00)	

Axle Weight 1st	<=5	0 – 65535kg	
Axle Weight 3rd	<=5	0 – 65535kg	
Axle Weight 4th	<=5	0 – 65535kg	
Tachograph Overspeed Signal	1	0|1	
Tachograph Vehicle Motion Signal	1	0|1	
Tachograph Driving Direction	1	0|1	
Analog Input Value	<=5	0-99999mV	
Engine Braking Factor	<=10	0-4278190079	
Pedal Braking Factor	<=10	0-4278190079	
Total Accelerator Kick-downs	<=6	0-999999	
Total Effective Engine Speed Time	<=10	0.00 – 9999999.99h	
Total Cruise Control Time	<=10	0.00 – 9999999.99h	
Total Accelerator Kick-down Time	<=10	0.00 – 9999999.99h	
Total Brake Applications	<=6	0-999999	
Tachograph Driver 1 Card Number	<=40	ASCII	
Tachograph Driver 2 Card Number	<=40	ASCII	
Tachograph Driver 1 Name	<=40	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Tachograph Driver 2 Name	<=40	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Registration Number	<=40	ASCII	
Expansion Information	<=4	00-FFFF	
Rapid Brakings	<=8	0-16711679	
Rapid Accelerations	<=8	0-16711679	
Engine Torque	<=3	0 – 100%	

Service Distance	<=8	-160635 – 327675km	
Ambient Temperature	<=4	-40 – +215 ℃	
DTC Number	<=2	0 – 99	
DTC 1	<=6	'0' – '9' 'a' – 'z' 'A' – 'Z'	
…			
DTC N	<=6	'0' – '9' 'a' – 'z' 'A' – 'Z'	
Reserved	0		
Reserved	0		
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	0|4	0XXX	
MNC	0|4	0XXX	
LAC	0|4	XXXX	
Cell ID	0|4|8	XXXX|XXXXXXXX	
Reserved	0		
Reserved	0		
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

CAN100 FOTA Upgrade Report

The device will send the message **+RESP:GTCFU** to the backend server during the upgrade process.

- **+RESP:GTCFU,**

Example:
+RESP:GTCFU,BD0211,862170011507322,,200,,20140723021417,0014$

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	3		
New Version (Optional)	<=10	'0'-'9', 'a'-'z'	<=10
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

✧ <*Code*>: Information code.

- 1x0: Confirm ok. Start to upgrade.
- 1x1: Baud rate error. UART does not work for CAN100. Stop upgrade.
- 1x2: The download process is refused because of low power or an incorrect URL.
- 1x3: Other upgrade commands are being executed. Stop upgrade.
- 1x4: CAN chipset response is abnormal.
- 1x5: The backend server cancels this update process.
- 2x0: Start to download package.
- 2x1: Package download succeeds.
- 2x2: Package download fails.
- 3x0: Start to upgrade.
- 3x1: Upgrade succeeds. The reserved parameter is used as follows.

New Version	<=10	'0'-'9', 'a'-'z'	

- 3x2: Upgrade fails.
- 3x3: Serial number does not match, firmware upgrade fails.
- 3x4: The upgrade process is refused because of low power.

Note: x here means <*Update Type*> defined in the **AT+GTCFU** command.

<*New Version*>: The version of the new firmware in the CAN100.

If network roaming state of the device changes, the current roaming state will be reported in the **+RESP:GTRMD** message. The message will be defined as an event message.

➢ **+RESP:GTRMD,**

Example: **+RESP:GTRMD,BD0213,864292043419363,CV200,1,2,0.0,0,223.3,114.015897,22.538992,20200527024521,0460,0001,2531,061A7D02,,20200527104521,0122$**			
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'	
Roaming State	1	0-3	
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	0|4	0XXX	
MNC	0|4	0XXX	
LAC	0|4	XXXX	
Cell ID	0|4|8	XXXX|XXXXXXXX	
Reserved	0		
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

✧ <*Roaming State*>: A numeral to indicate the roaming state.

- 0: Home
- 1: Known roaming
- 2: Unknown roaming
- 3: Blocking report

+RESP:GTSVR: Stolen vehicle recovery message reported by the Primary device.

➢ **+RESP:GTSVR,**

Example: **+RESP:GTSVR,BD0213,866775051515393,CV200,1,780541217821,70000000000000000000,,1,0.0,165,69.4,117.129187,31.839292,20220830115238,0460,0000,550B,B7A9,,,20220830195240,1079$**			
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' '-' '_'	
SVR Working State	1	0|1|2	
Ghost MAC Address	12	000000000000 - FFFFFFFFFFFF	
SVR Appending Information	<=30		
Reserved	0		
GNSS Accuracy	<=2	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	0|4	0XXX	
MNC	0|4	0XXX	
LAC	0|4	XXXX	
Cell ID	0|4|8	XXXX|XXXXXXXX	
Reserved	0		
Reserved	0		
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

✧ <*SVR Working State*>: It indicates the status in which the **+RESP:GTSVR** alert message is generated.

- 0: Primary loses connection with Ghost.
- 1: Primary regains connection with Ghost normally.
- 2: Primary fails to match Ghost during installation phase.

✧ <*SVR Appending Information*>: It indicates additional Bluetooth information. For now, it has the following values:

- 3: Unable to connect via Bluetooth.
- 7: Bluetooth connection successful.
- 8: Bluetooth connection successful, data decryption failed.
- 9: Bluetooth connection successful, data decryption successful, data verification failed.
- B: Bluetooth connection successful, no data available.

➢ **+RESP:GTPHL,**

This report is used for reporting location information before reporting photo data, and is only sent via network.

Example:
+RESP:GTPHL,BD0216,868446036599153,cv200,0,,20190826134803,1,0.0,0,100.6,114.015379,22.537494,20190826054804,0460,0001,253D,AEC3,,,,,,20190826134803,1770$

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' '-' '_'	
Camera ID	1	0-3	
Reserved	0		
Photo Time	14	YYYYMMDDHHMMSS	
GPS 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	
GPS UTC Time	14	YYYYMMDDHHMMSS	
MCC	0|4	0XXX	
MNC	0|4	0XXX	
LAC	0|4	XXXX	
Cell ID	0|4|8	XXXX|XXXXXXXX	
Reserved	2	00	00
Reserved	0		

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

- **+RESP:GTHBM**
- **+RESP:GTSOS**
- **+RESP:GTBTN**

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' '-' '_'	
MAC	0 | 17		
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	0|4	0XXX	
MNC	0|4	0XXX	
LAC	0|4	XXXX	
Cell ID	0|4|8	XXXX|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:GTWFS,**

Example: **+RESP:GTWFS,BD0216,864281043116186,CV200,2,5,queclink,,10.33.167.118,64:C4:03:AF:92:FF,,,,0,1,0.0,191,126.4,113.947999,22.573605,20240813065238,0460,0001,253E,06F75801,,,20240813065238,1FE8$**			
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' '-' '_'	
Mode	1	0|1|2	
Working State	<=2	0 – 13	
SSID	<=31		
Band Mode	1	1,2	
IP Address	<=15	0.0.0.0 – 255.255.255.255	
MAC Address	12	000000000000 – FFFFFFFFFFFF	
Reserved	0		
Reserved	0		
Reserved	0		
Access Point Client Number	1	0 – 8	
Reserved			
Client IP Address	<=15	0.0.0.0 – 255.255.255.255	
Client MAC Address	12	000000000000 – FFFFFFFFFFFF	
Reserved	0		
Reserved	0		

Reserved	0		
GNSS Accuracy	<=2	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	0|4	0XXX	
MNC	0|4	0XXX	
LAC	0|4	XXXX	
Cell ID	0|4|8	XXXX|XXXXXXXX	
Reserved	0		
Reserved	0		
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

- <*Mode*>: Please refer to the parameter <Mode> in the command **AT+GTWFS**.
- <*Working State*>: It indicates the status in which the **+RESP:GTWFS** alert message is generated.
  - 0: Off. WIFi enter off states.
  - 1: WiFi-STA external hotspot searching.
  - 2: WiFi-STA disabled.
  - 3: WiFi-STA failed.
  - 4: WiFi-STA external hotspot connected.
  - 5: WiFi-STA external hotspot disconnected.
  - 6: WiFi-STA external hotspot seraching Failed.
  - 7: WiFi-STA external hotspot authenticated Failed.
  - 11: WiFi-AP broadcasting.
  - 12: WiFi-AP disabled.
  - 13: WiFi-AP failed.
- <*SSID*>: Please refer to the parameter <SSID> in the command **AT+GTWFS.**
- <*Band Mode*>: It indicates the band mode in the current <*Working State*>:
  - 1 - 2.4GHz Band.
  - 2 - 5.0GHz Band.
- <*IP Address*>: It indicates the IP address in the current <*Working State*>.

- ✧ <*MAC Address*>: It indicates the MAC address in the current <*Working State*>. *Only valid for WiFi-STA.*
- ✧ <*Access Point Client Number*>: The number of the access point client.

➢ **+RESP:GTHBE**

HBE(Acceleration information for HBM), if harsh behavior is detected, and AT+GTHBM <Report Mode> =1|2, this message will be sent to the backend server.

Example:
+RESP:GTHBE,BD0217,869409067432065,CV200,,,11,1,10.2,192,28.9,113.954164,22.545614,20240831074154,,,,,,010000420826,0002003507FA,,1162.6,20240831074154,20240831074154,FF93$

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		
Harsh Behavior Type	2	10|11|12	
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	0|4	0XXX	
MNC	0|4	0XXX	
LAC	0|4	XXXX	
Cell ID	0|4|8	XXXX|XXXXXXXX	
Reserved	0		
Reserved	0		
Max Acceleration Data	12	'0'-'9' 'a'-'f'	
Average Acceleration	12	'0'-'9' 'a'-'f'	

Data			
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	$	$

- <*Max Acceleration Data*>: A string made up of 12 characters. It is a set of the maximal values of each axis collected during the occurrence of the harsh driving behavior. 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 are for Z axis acceleration data. The ASCII "0001" indicates HEX value 0x0001, so it means the acceleration is 1. The ASCII "fffd" indicates HEX value 0xFFFD which is the compliment of -3, so it means the acceleration is -3.
- <*Average Acceleration Data*>: There are 12 characters in a group of acceleration data. It is the average value of acceleration data which triggers this harsh behavior report. 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 are for Z axis acceleration data.The ASCII "0001" indicates HEX value 0x0001, so it means the acceleration is 1. The ASCII "fffd" indicates HEX value 0xFFFD which is the compliment of -3, so it means the acceleration is -3.
- <*Harsh Behavior Type*>
  The type of the harsh behavior.
  - 10 - Harsh braking behavior.
  - 11 - Harsh acceleration behavior.
  - 12 - Harsh cornering behavior.

➢ **+RESP:GTTTR,**

Example: **+RESP:GTTTR,BD0218,867995030090222,CV200,000C,2,,0002,0000B0000009,,,20190710152536,0925$**			
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' '-' '_'	
Request ID	4	0000 – FFFF	

Message Type	<=2	0 – 0B|0D|0E	
Reserved(option1)			
Reserved(option2)			
Reserved(option3)			
Reserved(option4)			
Reserved(option5)			
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

✧ <*Request ID*>: It is the response to the server with the same field <*Request ID*> in the command **AT+GTTTR**.

✧ <*Message Type*>:

- 0: Reply for DDD file request.

In this mode, <*Reserved(option1)*> … <*Reserved(option5)*> represent the following meanings:

Reply Result	1	0 – 4	
Device Status	2	0x00 – 0xFF	
File State in Memory	2	0x00 – 0xFF	
Error Code	2	0x00 – 0xFF	
Reserved			

- 1: Authorization result.

In this mode, <*Reserved(option1)*> … <*Reserved(option5)*> represent the following meanings:

Reply Result	1	0 – 3	
Device Status	2	0x00 – 0xFF	
Reserved			
Error Code	2	0x00 – 0xFF	
Reserved			

- 2: APDU Data received from CAN_Logistic.

In this mode, <*Reserved(option1)*> … <*Reserved(option5)*> represent the following meanings:

Reserved			

APDU Sequence Number	4		
APDU DATA			
Reserved			
Reserved			

- 3: The result of the process that CAN_Logistic reads file from tachograph.

In this mode, <*Reserved(option1)*> … <*Reserved(option5)*> represent the following meanings:

Reply Result	1	0 – 6	
Device Status	2	0x00 – 0xFF	
File State in Memory	2	0x00 – 0xFF	
Error Code	2	0x00 – 0xFF	
Reserved			

- 4: Communication timeout.

In this mode, <*Reserved(option1)*> … <*Reserved(option5)*> represent the following meanings:

Reserved			
Reserved			
Reserved			
Reserved			
Reserved			

- 5: Debug mode, the state of CAN_Logistic.

In this mode, <*Reserved(option1)*> … <*Reserved(option5)*> represent the following meanings:

Reserved			
Device Status	2	0x00 – 0xFF	
File State in Memory	2	0x00 – 0xFF	
Error Code	2	0x00 – 0xFF	
Error Code Memory	2	0x00 – 0xFF	

- 6: FSO transfer event.

In this mode, <*Reserved(option1)*> … <*Reserved(option5)*> represent the following meanings:

Reply Result	<=2	0 – 14	
Reserved			
Reserved			
Reserved			
Reserved			

- 8: Restart TachoReader.

In this mode, *<Reserved(option1)>* … *<Reserved(option5)>* represent the following meanings:

Reply Result	1	0|1	
Reserved			
Reserved			
Reserved			
Reserved			

- 9: Tachograph details.

Reserved			
Tachograph Producer	2		
Tachograph Model	<=40		
Reserved			
Reserved			

- 0A: Inquiry status of the device.

Reserved			
Reserved			
Device Status/Files in Device Memory	4	X(0-FF)Y(0-FF)	
Reserved			
Reserved			

- 0B: Inquiry Tachograph driver 1 ID, name and surname, and driver time related states.

Reserved			
Tachograph Driver Time	2	0x00 – 0xFF	

related states			
Tachograph Driver 1 ID	<=40		
Tachograph Driver 1 Name and Surname	<=40		
Reserved			

- 0D: Check the current TachoReader connection environment and the device whether ready to download DDD.

In this mode, <*Reserved(option1)*> … <*Reserved(option5)*> represent the following meanings:

CAN2-bus or J1708-bus Status	1	0 – 3	
Check Information	2	00 – FF	
Reserved			
Reserved			
Reserved			

- 0E: Reply setting Tachograph file format.

In this mode, <Reserved(option1)> … <Reserved(option5)> represent the following meanings:

Reply Result	2	00 | 09 |FF	
Reserved			
Reserved			
Reserved			
Reserved			

✧ <*Reply Result*>: If <*Message Type*> is 0 (Reply for DDD file request), it is reply on inquiry read request.

- 0: Request OK.
- 1: Request busy: Advanced test.
- 2: Request busy: CAN_Logistic is executing precious order.
- 3: Request busy: Configuration of the cancel order.
- 4: Request busy: The order is forbidden as the device is downloading files now.

If <*Message Type*> is 1 (Authorization result), it is reply on inquiry the status of the device:

- 0: Authorization OK.
- 1: Authorization fails.
- 2: Authorization timeout.
- 3: Authorization data error.

If <*Message Type*> is 2, this field will be reserved.

If <*Message Type*> is 3 (file reading), it is result of file reading:

- 0: CAN_Logistic getting file from Tachograph OK.
- 1: CAN_Logistic getting file from Tachograph fail.
- 2: File mismatch.
- 3: CAN_Logistic getting file from Tachograph timeout.
- 4: Device getting file from CAN_Logistic timeout.
- 5: Device getting file from CAN_Logistic fail.
- 6: DDD file size error.

If <*Message Type*> is 6, it is the event of FSO transfer.

- 0: FSO open server OK.
- 1: Reserved.
- 2: Reserved.
- 3: Reserved.
- 4: Reserved.
- 5: Reserved.
- 6: Reserved.
- 7: Reserved.
- 8: FSO open server error.
- 9: Reserved.
- 10: FSO send data OK.
- 11: Reserved.
- 12: FSO send data error.
- 13: Reserved.
- 14: Reserved.

If <*Message Type*> is 8(Restart TachoReader), it is result of command execution.

- 0: Command OK. The command is executed successfully by TachoReader.
- 1: Command Error. An unexpected error occurs while executing the command.

If <*Message Type*> is 0x0E (Setting Tachograph File Format), it is result of setting tachograph file format.

- 00: Tachograph file format set successfully.
- 09: Reading tachograph files is disabled.
- FF: Setting failure.

✧ <*APDU Sequence Number*>: It is the serial number of APDU received from CAN_Logistic. Numbering starts from 0000 when receiving a new DDD file request. This value is in ASCII hexadecimal format.

✧ <*APDU DATA*>: It is the APDU received from CAN_Logistic. The value is in ASCII hexadecimal format.

✧ <*Device Status*>:

- Bit 0 = 1 – Authentication in progress,
- Bit 1 = 1 – Authentication OK (bit is cleared at next read request),
- Bit 2 = 1 – Authentication ERROR (bit cleared at next read request),
- Bit 3 = 1 –CAN_Logistic is downloading files from tachograph,
- Bit 4 = 1 – Data is ready to read from CAN_Logistic by master device. Bit is cleared

after all awaiting data is read (If all bytes are sent in one frame, this bit will be cleared after sending this frame. If all bytes are sent in 3 frames, this bit will be cleared after sending 3 frames).

- Bit 7:Bit 5 = Details of the error. Flags bit 7:bit 5 and flag bit 2 must be treated as combined information. The information is split to maintain protocol's backward compatibility. Flags bit 7:bit 5 are cleared at next read request.
  - 000 – No error
  - 001 – 24 hours have passed after turning off the ignition, tachograph is in power down mode. (This error code is generated based on CAN_Logistic's timer, there is no attempt of connection with tachograph)
  - 010 – 2hours have passed after last authentication session, tachograph is in power down mode. (This error code is generated based on CAN_Logistic's timer, there is no attempt of connection with tachograph)
  - 011 – No answer from tachograph (wrongly connected wires or CAN-C is off in tachograph)
  - 100 – Cannot open communication session with tachograph (remote download function is off in tachograph)
  - 101 – No answer or incorrect answer on company card inquiry (remote download function is off in tachograph).
  - 110 – Error during file transfer.
  - 111 – Reserved for future use.

✧ <*File State in Memory*>:

- Bit 0 = 1 tachograph file is in CAN_Logistic memory,
- Bit 1 = 1 file from card in slot 1 is in CAN_Logistic memory,
- Bit 2 = 1 file from card in slot 2 is in CAN_Logistic memory,
- Bit 3~7 = not used (to be ignored),

✧ <*Error Code*>: Extended error code. A detailed description of the value of this byte below:

Note: Following error codes can be found in protocol (CAN-Logistic v3 protocol XON-XOFF).

- 0x00 – No error detected. Report to the device producer.
- 0x02 – No communication with tachograph. Switch the ignition on and try again. If it does not help, check out CANBUS connection to tachograph.
- 0x0A – Invalid timestamps in read request (7.3.1), start time cannot be later than end time. Correct the request (7.3.1) content.
- 0x0B – CAN-Logistic does not receive real time clock from tachograph, so TSE in read request (7.3.1) cannot be set to 0. Provide the TSE date in request command 7.3.1.
- 0x0C – Invalid read request command (7.3.1). No file requested to download. Correct the request content.
- 0x0E – Error opening session. Report to the device producer.
- 0x0F – No response after sending ATR. Report to the device producer.
- 0x11 – Timeout on waiting for data from company card. CAN-Logistic expected to get reply from company card, but it did not come. Check data transmission path between application server, AVL Terminal and CAN-Logistic and try again.
- 0x18 – No data for company card from tachograph. Report to the device producer.

- 0x19 – Error during authorization. A diagnostic file is required to analyse more about this error.
- 0x1B – Data transfer error. Report to the device producer.
- 0x20 – Error during the authorization process. Report to the device producer.
- 0x21 – Error while downloading the file from the tachograph to the CAN-Logistic memory. Report to the device producer.
- 0x22 – Requested to read activities part since date of last reading, but the date is not available. Correct the request content – set start date.
- 0x23 – Requested to read activities part since date of last reading, but the date is later than requested end time. Correct the request content – change end date.
- 0x30 – Error initializing authorization. Report to the device producer.
- 0x31 – Error during the authorization process. Report to the device producer.
- 0x32 – Error during the authorization process. Report to the device producer.
- 0x33 – Error during the authorization process. Report to the device producer.
- 0x34 – Error during the authorization process. Report to the device producer.
- 0x35 – Error closing session. Report to the device producer.
- 0x39 – Requested cards download, but no cards in tachograph's slots. Insert card(s) into tachograph or correct the request (7.3.1) content.
- 0x3A – Error during the authorization process. Report to the device producer.
- 0x3B – Error initializing authorization. Report to the device producer.
- 0x3C – Error during the authorization process. Report to the device producer.
- 0x3D – Error while downloading the file from the tachograph to the CAN-Logistic memory. Report to the device producer.
- 0x3E – Error during the authorization process. Report to the device producer.
- 0x3F – Error opening session. Report to the device producer.
- 0x40 – Downloading finished with no files, because of missing data (i.e. requested cards was removed). Try again. If the error persists, report to the device producer.
- 0x41 – Error opening session. Report to the device producer.
- 0x42 – Error downloading file – invalid package sequence. Report to the device producer.
- 0x55 – Data access denied or communication error. Report to the device producer.
- 0x6A – Remote authentication closed. Report to the device producer.
- 0x6C – APDU error. Report to the device producer.
- 0x6E – Authentication error. Check if company card is not expired. If not, report to the device producer.
- 0x70 – Too many authentication errors. Report to the device producer.
- 0x80 – Error opening session. Report to the device producer.
- 0x90 – Error while sending UDS packet. Report to the device producer.
- 0xFD – Is a cancel of authorization.
- 0xE1 – There is no operation to perform. Bits SD, SC, SA in byte FL are set. Correct the request (7.3.1) content.
- 0xEE – Downloaded files exceed CAN-Logistic's memory. Repeat request with narrower activities range of tachograph DDD file.
- 0xEF – Failed to write the file to CAN-Logistic's internal memory. Report to the

device producer.

- 0xFE – Request cancelled by command 7.3.2. Start new request whenever you are ready.
- 0xFF – No reading requested since device restart. Start new request whenever you are ready.

✧ <*Error Code Memory*>: This is the error code byte <*Error Code*> stored when the next order of the download is sent.

✧ <*Tachograph Producer*>:

- 0x00: None,
- 0x01: VDO/Siemens,
- 0x02: Efas,
- 0x03: Stoneridge,
- 0x04: Actia,
- 0x80: Error of connection on D8 wire,
- 0x81: Not supported format „2400" analogue tachographs.

✧ <*Tachograph Mode*>: Tachograph name given by the manufacturer.

✧ <*Device Status/Files in Device Memory*>:

- Device status
- Files in device memory

✧ <*Tachograph Driver Time Related States*>: Driver time related state.

0 – normal/no limits reached
1 – 15 min before 4½ h
2 – 4½h reached
3 – 15 min before 9 h
4 – 9h reached
5 – 15 minutes before 16h (not having 8h rest during the last 24h)
6 – 16h reached
7 – week's driving time limit about to be reached
8 – week's driving time limit exceeded
9 – fortnight's driving time limit about to be reached
A – fortnight's driving time limit exceeded
B – driver's card validity term about to end
C – driver's card reading time approaching soon
D – other
E – error on CAN-bus
F – parameter currently not available

✧ <*Tachograph Driver 1 ID*>: Card number given in ASCII string terminated with „*". First two or three letters are country code. Following is a SPACE character (0x20) and the 16-character long card number e.g.

PL 1820625133460000*

In addition to standard country codes, the following abbreviations also apply:

- „EC" - European Union,
- „EUR" – Rest of Europe,
- „WLD" – rest of the world.

✧ <*Tachograph Driver 1 Name and Surname*>: Surname and name (names) of driver given in an ASCII string terminated with „*”. Each word is separated by a SPACE character (0x20).

Note: Number K will be returned if the card is not inserted into tachograph slot (or parameter currently not available; or card inserted, but no information read).

- K = 0x00 card not inserted,
- K = 0x01 card inserted, but no information read,
- K = 0xFF parameter currently not available.

✧ <*CAN2-bus or J1708-bus Status*>: It indicates the status of the CAN2-bus or J1708-bus.

- 0: Bus in sleep mode
- 1: Bus active
- 2: Bus error
- 3: 2nd CANbus or J1708-bus not used

✧ <*Check Information*>: It indicates the set of states associated with the tachographer.

MSB	R	R	F1	F0	T1	T0	D1	D0	LSB

R – Reserved

F1:F0 – remote DDD files downloading from tachograph

- b'00' – remote download disabled
- b'01' – remote download enabled
- b'10' – communication error
- b'11' – communication with tachograph not supported with current device settings

T1:T0 – communication with tachograph

- b'00' – no communication with tachograph
- b'01' – tachograph online
- b'10' – communication error
- b'11' – communication with tachograph not supported with current device settings

D1:D0 – D8 (K-Line) Bus activity

- b'00' – Bus in sleep mode
- b'01' – Bus active
- b'10' – Bus error
- b'11' –Bus not used

➢ **+RESP:GTTRL,**

This message is used to report location position and DDD information before reporting DDD data.

Example:
+RESP:GTTRL,BD0218,867995030090222,CV200,0002,C_20190712_0700_DARIUS_TAMASAUSKAS_V100000108084000.DDD,0,0.0,0,101.1,117.129125,31.839185,20190712065656,0460,0000,550B,B969,00,,,,,20190712145659,1802$

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' '-' '_'	
File Download Count	4	0001 – FFFF	
DDD File Name	<=128		
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	-180 – 180	
Latitude	<=10	-90 – 90	
GNSS UTC Time	14	YYYYMMDDHHMMSS	
MCC	0|4	0XXX	
MNC	0|4	0XXX	
LAC	0|4	XXXX	
Cell ID	0|4|8	XXXX|XXXXXXXX	
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Characters	1	$	$

✧ <*File Download Count*>: It is a number that marks the messages between **+RESP:GTTRD** and **+RESP:GTTRL**.

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

➢ **+RESP:GTTRD,**

This message is used to report DDD data.

Example:

+RESP:GTTRD,BD0218,867995030090222,CV200,000A,,,0,18,490,303834303030FFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFF011F56313030303030313038303834303030FFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFF0208015D1205395D12E4E1011F56313030303030313038303834303030FFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFF011F56313030303030313038303834303030FFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFF0108015D1339F75D1587A9011F56313030303030313038303834303030FFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFF011F56313030303030313038303834303030FFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFF0108015D15DFB15D196460011F563130303030,,,,,20190710153859,0956$			
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' '-' '_'	
File Download Count	4	0001-FFFF	
Reserved	0		
Reserved	0		
File Frame End flag	1	0|1	
Current Frame Index	<=3		
DDD Data Length	<=3		
DDD Data	<=684		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Characters	1	$	$

✧ <*File Frame End Flag*>: The flag of last frame.
- 0: Not the last frame of file.
- 1: The last frame of file.

✧ <*Current Frame Index*>: The index of frames.

✧ <*DDD Data Length*>: The length of DDD data in current frame.

✧ <*File Download Count*>: It is a number that marks the messages between **+RESP:GTTRD** and **+RESP:GTTRL**.

➢ **+RESP:GTRTP,**

Example: **+RESP:GTRTP,BD0218,135790246811220,,200,1,20090101000000,11F0$**			
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'	
Mode	1	0	
Protocol type	1	0	
File Type	1	0 - 2	
Code	<=4		
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000-FFFF	
Tail Character	1	$	$

✧ <*Mode*>: Set the working mode of file transfer.
- 0: Download file

✧ <*Protocol type*>: The type of communication protocol used to obtain data from the backend server.
- 0: HTTP.
- 2: FTP.

✧ <*File Type*>: It defines the type of file to download from the server.
- 0: CA certificate
- 1: Client Certificate
- 2: Client key

✧ <*Code*>: It indicates the download information.
- 100: The update command is starting.
- 101: The update command is refused by the device.
- 200: The device starts to download the file.
- 201: The device finishes downloading the file successfully.
- 202: The device fails to download the file.
- 301: The device finishes updating the file successfully.
- 302: The device fails to update the file.

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	0|4	0XXX	
MNC	0|4	0XXX	
LAC	0|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...,20200527120102,0

24B$

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 2047 in decimal format and –g is -2047. The linearized acceleration data 32767 represents +16g and -32768 represents -16g.

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	<=3	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	<=3	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.

- **+RESP:GTPHD,**

This report is used for reporting photo data and only sent via network even if the report mode is Force on SMS.

Example:

+RESP:GTPHD,BD0213,868446036599153,cv200,0,,20190826134803,6,1,912,/9j/2wCEAA0JCQsJCA0LCgsODQ0PEx8UExEREyYbHRcfLSgwLy0oLCsyOEg9MjVENissP1U/REpNUFFQMDxYX1hOXkhPUE0BDQ4OExATJRQUJU00LDRNTU1NTU1NTU1NTU1NTU1NTU1NTU1NTU1NTU1NTU1NTU1NTU1NTU1NTU1NTU1NTf/AABEIAHgAoAMBIQACEQEDEQH/3QAEAAr/xAGiAAABBQEBAQEBAQAAAAAAAAAAAQIDBAUGBwgJCgsQAAIBAwMCBAMFBQQEAAABfQECAwAEEQUSITFBBhNRYQcicRQygZGhCCNCscEVUtHwJDNicoIJChYXGBkaJSYnKCkqNDU2Nzg5OkNERUZHSElKU1RVVldYWVpjZGVmZ2hpanN0dXZ3eHl6g4SFhoeIiYqSk5SVlpeYmZqio6Slpqeoqaqys7S1tre4ubrCw8TFxsfIycrS09TV1tfY2drh4uPk5ebn6Onq8fLz9PX29/j5+gEAAwEBAQEBAQEBAQAAAAAAAAECAwQFBgcICQoLEQACAQIEBAMEBwUEBAABAncAAQIDEQQFITEGEkFRB2FxEyIygQgUQpGhscEJIzNS8BVictEKFiQ04SXxFxgZGiYnKCkqNTY3ODk6Q0RFRkdISUpTVFVWV1hZWmNkZWZnaGlqc3R1dnd4eXqCg4SFhoeIiYqSk5SVlpeYmZqio6Slpqeoqaqys7S1tre4ubrCw8TFxsfIycrS09TV1tfY2dri4+Tl5ufo6ery8/T19vf4+fr/2gAMAwEAAhEDEQA/AMELUgWmjMeowas21zLazJNE5V0IZT6GmBpap4muNV08W1zFEWVgwkUEGuckXNSVe5XeOmomHBIBx2NAHbxaVpD/AGbVdPPkiVGBhJ3CN+/X6msTXCNOuo7o,,,,20190826134803,1771$

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' '-' '_'	
Camera ID	1	0-3	
Reserved	0		
Photo Time	14	YYYYMMDDHHMMSS	
Total Frames	<=3		
Current Frame Index	<=3		
Photo Data Length	<=4		
Photo Data	<=1300		

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

- ✧ <Total Frames>: Total number of data frames that report to server.
- ✧ <Current Frame Index>: The index of frames.
- ✧ <Photo Data Length>: Data length of the current frame.

➢ **+RESP:GTACC,**

The device will report 75 sets of tri-axial acceleration data to the backend server in the message **+RESP:GTACC**. The device will report the message every 3 seconds, and record 25 pieces of XYZ-axis acceleration data per second.

Example:

+RESP:GTACC,BD0217,864281043113704,CV200,FFCEFFCD07F7FFD1FFCB07FCFFCDFFCA07FFFFD1FFCE07FEFFCFFFCC07FAFFCFFFCC07F7FFCEFFCE07FBFFCDFFCB07FEFFCEFFCB0800FFCFFFCD07FCFFCEFFCE07F7FFD1FFCE07F8FFCFFFCC07FAFFCFFFCC07FEFFCFFFCB07FCFFD2FFCD07F7FFCFFFCE07F8FFCFFFCE07FBFFCEFFCC07FCFFCEFFCB07FDFFCFFFCC07FBFFD0FFCF07F7FFCEFFCC07F9FFCEFFCD07FCFFCEFFCD07F9FFD0FFCD07FDFFCFFFCC07FFFFCEFFCC07FAFFCFFFCC07F7FFD0FFCD07FBFFCFFFCD07FEFFCFFFCD07FEFFCFFFCE07F9FFCEFFCC07F5FFD0FFCC07F7FFCEFFCC07FDFFCFFFCC07FEFFD1FFCD07F9FFD1FFD007F6FFCFFFCD07F8FFCFFFCE07FCFFD1FFCF07FDFFCEFFCD07FCFFCDFFCC07FCFFD0FFCD07F7FFD1FFCC07FAFFCFFFCC07FDFFCEFFCC07FDFFD0FFCF07F8FFCEFFCC07FDFFCFFFCD07F8FFD1FFCE07F8FFD1FFCD07FAFFD1FFCC07FDFFD0FFCB0800FFCCFFCB07F8FFCFFFCF07F8FFD1FFCC07F9FFCEFFCE07FEFFCFFFCD07FFFFD2FFCD07FDFFCFFFCE07F9FFCEFFCE07F9FFD0FFCD07FAFFD1FFCC07FCFFCFFFCB07FDFFCEFFCD07F7FFCFFFCD07F9FFD1FFCB07FAFFCEFFCD07FFFFCEFFCB07FBFFCEFFCD07FAFFD0FFCE07F8FFCFFFCD07F8FFD0FFD007FC,,,,2024081710 0038,00D5$

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	12*75	'0'-'9' 'A'-'F'	
Reserved	0		
Reserved	0		

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

✧ <*Data*>: There are 12*75 ASCII characters in the message with 12 characters in a group. 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 are for Z axis acceleration data. The ASCII "0001" represents HEX value 0x0001, so it means the acceleration is 1. The ASCII "fffd" represents HEX value 0xFFFD which is the complement of -3, so it means the acceleration is -3

Example:

- **+RESP:GTACC**,740802,864292043426376,,000100010055…,,,,20200623030021,863D$ This is the earliest XYZ-axis acceleration data: Conversion to hex format: X (axis acceleration data) = 0x0001; Y = 0x0001; Z = 0x0055; Decimal format: X (axis acceleration data) = 1; Y = 1; Z = 85;
- **+RESP:GTACC**,740802,864292043426376,,ffffff10052…,,,,20200623030022,863E$ This is the latest XYZ-axis acceleration data: Conversion to hex format: X (axis acceleration data) = 0xFFFF; Y = 0xFFF1; Z = 0x0052; Decimal format: X (axis acceleration data) = -1; Y = -15; Z = 82;

Note:

Acceleration of gravity (+g) is 2047 in decimal format and - g is -2047. The linearized acceleration data 32767 represents +16g and -32768 represents -16g.

2.3.10.CANBUS Device Information Report

2.3.10.1. +RESP:GTCAN

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

➢ **+RESP:GTCAN,**

Example:
+RESP:GTCAN,BD0216,864281043113704,cv200,01,0,F03FFFFF,,0,I13728,10.02,273,30,51,,L1000.00,100,70,2500.00,2000.00,400.00,80.02,21777,FFFF,FFFF,3F,3F,450.00,200.00,FFFFFF,,,,,,,,,,,,,,,,,,,,,,1FFF,1000,5000,,8240,P28.40,125,125,,,1,0.0,73,98.9,113.947978,22.573572,20240516115420,,,,,,20240516115420,7F4C$

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' '-' '_'	
Distance Type / Report Type	2	X(0)X(0-5)	
CANBUS Device State	1	0|1	
CANBUS Report Mask	<=8	0 - FFFFFFFF	
VIN	17	'0' - '9' 'A' - 'Z' except 'I', 'O', 'Q'	
Ignition Key	1	0|1|2	
Total Distance	<=12	H(0 – 99999999)/I(0 – 2147483647)	
Total Fuel Used	<=9	0.00 – 999999.99L	
Engine RPM	<=5	0 – 16383 rpm	
Vehicle Speed	<=3	0 - 455Km/h	
Engine Coolant Temperature	<=4	-40 – +215 ℃	
Fuel Consumption	<=6	L/100km(0.0–999.9)|L/H(0.0 –999.9)	
Fuel Level	<=8	L(0.00–9999.99)/P(0.00 – 100.00)	
Range	<=8	0 – 99999999hm	
Accelerator Pedal Pressure	<=3	0 – 100%	
Total Engine Hours	<=10	0.00 – 9999999.99h	
Total Driving Time	<=10	0.00 – 9999999.99h	
Total Engine Idle Time	<=10	0 .00– 9999999.99h	
Total Idle Fuel Used	<=9	0.00 –999999.99L	
Axle Weight 2nd	<=5	0 – 65535kg	
Tachograph Information	<=4	00-FFFF	
Detailed Information | Indicators	<=4	00-FFFF	
Lights	<=2	0-FF	
Doors	<=2	0-FF	

Total Vehicle Overspeed Time	<=10	0.00 – 9999999.99h	
Total Vehicle Engine Overspeed Time	<=10	0.00 – 9999999.99h	
Engine Cold Starts Count	<=8	0 – 16449535	
Engine All Starts Count	<=8	0 – 16449535	
Engine Starts by Ignition Count	<=8	0 – 16449535	
Total Engine Cold Running Time	<=9	0 – 421108120s	
Handbrake Applies During Ride Count	<=5	0 – 64255	
CAN Report Expansion Mask	<=8	0 - FFFFFFFF	
Ad-Blue Level	<=8	L(0.00–9999.99)/P(0.00 – 100.00)	
Axle Weight 1st	<=5	0 – 65535kg	
Axle Weight 3rd	<=5	0 – 65535kg	
Axle Weight 4th	<=5	0 – 65535kg	
Tachograph Overspeed Signal	1	0|1	
Tachograph Vehicle Motion Signal	1	0|1	
Tachograph Driving Direction	1	0|1	
Analog Input Value	<=5	0-99999mV	
Engine Braking Factor	<=10	0 – 4278190079	
Pedal Braking Factor	<=10	0 – 4278190079	
Total Accelerator Kick-downs	<=6	0-999999	
Total Effective Engine Speed Time	<=10	0.00 – 9999999.99h	
Total Cruise Control Time	<=10	0.00 – 9999999.99h	
Total Accelerator	<=10	0.00 – 9999999.99h	

Kick-down Time			
Total Brake Applications	<=6	0-999999	
Tachograph Driver 1 Card Number	<=40	ASCII	
Tachograph Driver 2 Card Number	<=40	ASCII	
Tachograph Driver 1 Name	<=40	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Tachograph Driver 2 Name	<=40	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Registration Number	<=40	ASCII	
Expansion Information	<=4	00 – FFFF	
Rapid Brakings	<=8	0 – 16711679	
Rapid Accelerations	<=8	0 – 16711679	
Engine Torque	<=3	0 – 100%	
Service distance	<=8	-160635 – 327675km	
Ambient Temperature	<=4	-40 – +215 ℃	
DTC Number	<=2	0 – 99	
DTC 1	<=6	'0' – '9' 'a' – 'z' 'A' – 'Z'	
…			
DTC N	<=6	'0' – '9' 'a' – 'z' 'A' – 'Z'	
Gaseous Fuel Level	<=8	L(0.00–9999.99)/P(0.00 – 100.00)	
Tachograph Information Expand	8	00000000 – FFFFFFFF	
CAN Report Expansion Mask1	<=8	0 – FFFFFFFF	
Retarder Usage	<=3	0 – 125%	
Power Mode	<=2	0 – FF	
Tacho Timestamp	14	YYYYMMDDHHMMSS	
Electric Report Mask	<=8	0 - FFFFFFFF	
Battery Instantaneous Voltage	<=5	0 – 64255 V	

Battery Charging Cycles Count	<=5	0 – 64255 Cycle	
Total Energy Recuperated	<=10	0 – 4211081215 Wh	
Battery Level	<=8	P(0.00 - 100.00)	
Charge State	<=2	0 – FF	
Battery Temperature	<=4	-40 – +215 °C	
Battery Charging Current	<=3	0 - 125(A)	
Battery Instantaneous Power	<=7	-327680 – 325110 W	
Battery State of Health (SoH)	<=3	0 – 100 %	
Total Energy Used	<=10	0 – 4211081215 Wh	
Total Energy Used When Idling	<=10	0 – 4211081215 Wh	
Total Energy Charged	<=10	0 – 4211081215 Wh	
Battery Charging Remaining Time	<=5	0 - 65535 (min)	
Tachograph Driver1 Working Time Mask	<=8	0 – FFFFFFFF	
Drv1 End of Last Daily Rest Period	12	YYYYMMDDHHMM	
Drv1 End of Last Weekly Rest Period	12	YYYYMMDDHHMM	
Drv1 End of Second Last Weekly Rest Period	12	YYYYMMDDHHMM	
Drv1 Maximum Daily Period	<=3	0 – 250	
Drv1 Number of Times 9h Daily Driving Times Exceeded	<=3	0 – 250	
Drv1 Number of Used Reduced Daily Rest Periods	<=3	0 – 250	
Drv1 Remaining Current Drive Time	<=5	0 – 65535min	

Drv1 Remaining Time Until Next Break or Rest	<=5	0 – 65535min	
Drv1 Duration of Next Break Rest	<=5	0 – 65535min	
Drv1 Remaining Time of Current Break Rest	<=5	0 – 65535min	
Drv1 Time Left Until Next Driving Period	<=5	0 – 65535min	
Drv1 Duration of Next Driving Period	<=5	0 – 65535min	
Drv1 Remaining Driving Time on Current Shift	<=5	0 – 65535min	
Drv1 Time Left Until New Daily Rest Period	<=5	0 – 65535min	
Drv1 Minimum Daily Rest	<=5	0 – 65535min	
Drv1 Remaining Driving Time of Current Week	<=5	0 – 65535min	
Drv1 Time Left Until New Weekly Rest Period	<=5	0 – 65535min	
Drv1 Minimum Weekly Rest	<=5	0 – 65535min	
Drv1 Open Compensation in The Last Week	<=5	0 – 65535min	
Drv1 Open Compensation in Week Before Last	<=5	0 – 65535min	
Drv1 Open Compensation in 2nd Week Before Last	<=5	0 – 65535min	
Drv1 Continuous Driving Time	<=5	0 – 65535min	
Drv1 Cumulative Break Time	<=5	0 – 65535min	
Drv1 Current Duration of Selected Activity	<=5	0 – 65535min	
Drv1 Accumulated Driving Time Previous and Current Week	<=5	0 – 65535min	

Drv1 Current Daily Driving Time	<=5	0 – 65535min	
Drv1 Current Weekly Driving Time	<=5	0 – 65535min	
Drv1 Cumulative Uninterrupted Rest Time	<=5	0 – 65535min	
Drv1 Maximum Daily Driving Time	<=5	0 – 65535min	
Tachograph Driver2 Working Time Mask	<=8	0 – FFFFFFFF	
Drv2 End of Last Daily Rest Period	12	YYYYMMDDHHMM	
Drv2 End of Last Weekly Rest Period	12	YYYYMMDDHHMM	
Drv2 End of Second Last Weekly Rest Period	12	YYYYMMDDHHMM	
Drv2 Maximum Daily Period	<=3	0 – 250	
Drv2 Number of Times 9h Daily Driving Times Exceeded	<=3	0 – 250	
Drv2 Number of Used Reduced Daily Rest Periods	<=3	0 – 250	
Drv2 Remaining Current Drive Time	<=5	0 – 65535min	
Drv2 Remaining Time Until Next Break or Rest	<=5	0 – 65535min	
Drv2 Duration of Next Break Rest	<=5	0 – 65535min	
Drv2 Remaining Time of Current Break Rest	<=5	0 – 65535min	
Drv2 Time Left Until Next Driving Period	<=5	0 – 65535min	
Drv2 Duration of Next Driving Period	<=5	0 – 65535min	

Drv2 Remaining Driving Time on Current Shift	<=5	0 – 65535min	
Drv2 Time Left Until New Daily Rest Period	<=5	0 – 65535min	
Drv2 Minimum Daily Rest	<=5	0 – 65535min	
Drv2 Remaining Driving Time of Current Week	<=5	0 – 65535min	
Drv2 Time Left Until New Weekly Rest Period	<=5	0 – 65535min	
Drv2 Minimum Weekly Rest	<=5	0 – 65535min	
Drv2 Open Compensation in The Last Week	<=5	0 – 65535min	
Drv2 Open Compensation in Week Before Last	<=5	0 – 65535min	
Drv2 Open Compensation in 2nd Week Before Last	<=5	0 – 65535min	
Drv2 Continuous Driving Time	<=5	0 – 65535min	
Drv2 Cumulative Break Time	<=5	0 – 65535min	
Drv2 Current Duration of Selected Activity	<=5	0 – 65535min	
Drv2 Accumulated Driving Time Previous and Current Week	<=5	0 – 65535min	
Drv2 Current Daily Driving Time	<=5	0 – 65535min	
Drv2 Current Weekly Driving Time	<=5	0 – 65535min	
Drv2 Cumulative Uninterrupted Rest Time	<=5	0 – 65535min	
Drv2 Maximum Daily Driving Time	<=5	0 – 65535min	
Reserved	0		
Reserved	0		

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

✧ <*Distance Type/Report Type*>: It indicates the type of total distance (unit: hm) and the report type.

<*Distance Type*> has the following meanings:

- 0: Total distance acquired from CAN Chipset.

<*Report Type*> has the following meanings:

- 0: Periodic report.
- 1: RTO CAN report.
- 2: Ignition event report.
- 3: Tachograph Driver Card ID changed event report.
- 4: Tachograph Driver working status or “Out of Scope” condition changed event report.
- 5: Ignition key changed event report.

✧ <*CANBUS Device State*>: A numeral to indicate the communication state with the external CANBUS device.

- 0: Abnormal. It fails to receive data from the external CANBUS device.
- 1: Normal. It can receive data from the external CANBUS device.

✧ <*CANBUS Report Mask*>: Please refer to <*CAN Report Mask*> in **AT+GTCAN**.

✧ <*VIN*>: Vehicle identification number.

✧ <*Ignition Key*>: A numeral to indicate the ignition status.

- 0: Ignition off.

- 1: Ignition on.
- 2: Engine on.

✧ <*Total Distance*>: Vehicle total distance. The number is always increasing. The unit is hectometer (H) or distance impulse (I) (if distance from dashboard is not available).

✧ <*Total Fuel Used*>: The number of liters of fuel used since vehicle manufacture or device installation. Total fuel or energy used - read from vehicle. The unit is liter.

✧ <*Fuel Level*>: The level of fuel in vehicle tank. The unit is liter (L) or percentage (P).

✧ <*Range*>: The number of hectometers to drive on remaining fuel. The unit is hectometer.

✧ <*Vehicle Speed*>: The vehicle speed based on wheel. The unit is km/h.

✧ <*Engine RPM*>: The revolutions per minute. The unit is rpm.

✧ <*Accelerator Pedal Pressure*>: The unit is percentage.

✧ <*Engine Coolant Temperature*>: The unit is Celsius. Negative value is preceded by negative sign (-), e.g. "-2". If the value is positive, no extra character is inserted, e.g. "20".

✧ <*Fuel Consumption*>: The fuel consumption is calculated based on values read from vehicle. The unit is L/100Km(M) or L/H(H).

✧ <*Total Engine Hours*>: Time of engine running since vehicle manufacture or device installation. The unit is hour.

✧ <*Total Driving Time*>: Time of engine running (non-zero speed) since vehicle manufacture or device installation. The unit is hour.

✧ <*Total Engine Idle Time*>: Time of engine running during idling status (vehicle at rest) since vehicle manufacture or device installation. The unit is hour.

✧ <*Total Idle Fuel Used*>: The number of liters of fuel used since vehicle manufacture or device installation. Total idle fuel or energy used - with vehicle speed 0 km/h. The unit is liter.

✧ <*Axle Weight 2nd*>: Weight of vehicle's second axle. The unit is kg.

✧ <*Tachograph Information*>: Two bytes. The high byte describes driver 2, while the low byte describes driver 1.

Each byte format:

V	R	W1	W0	C	T2	T1	T0

V: Validity mark (0 – valid driver data, 1 – no valid data)

R: Reserved

C: Driver card (1 – card inserted, 0 – no card inserted)

T2-T0: Driving time related states:

- 0: Normal / no limits reached.
- 1: 15min before 4½h.
- 2: 4½h reached.
- 3: 15min before 9h.
- 4: 9h reached.
- 5: 15minute before 16h (without 8h rest during the last 24h).
- 6: 16h reached.
- 7: Other limit.

W1-W0: Driver working states:

- 0: Rest - sleeping.
- 1: Driver available – short break.
- 2: Work – loading, unloading, working in an office.

- 3: Drive – behind the wheel.

✧ <*Tachograph Information Expand*>: Four bytes. The high byte describes driver working states, while the low byte describes tachograph other information and the middle two bytes describe driver 1 information and driver 2 information respectively.

Driver working states	Driver 1 information	Driver 2 information	Tachograph other information
High byte(T)	K1	K2	Low Byte(I)

T: Driver working states:

MSB	OUT1	OUT0	TD2	TD1	TD0	TP2	TP1	TP0	LSB

OUT1:OUT0 – “out of scope” condition (2 bits)

- b'00' – no out of scope condition opened, normal operation
- b’01’ – out of scope condition opened
- b’10’, b’11’– Invalid data.

TD2:TD0 – Driver 2 working state (3 bits)

TP2:TP0 – Driver 1 working state (3 bits)

- b'000': Rest - sleeping.
- b'001': Driver available – short break.
- b'010’: Work – loading, unloading, working in an office.
- b’011’: Drive – behind the wheel.
- b’100’, b’101’ – reserved.
- b’110’ – Invalid data.

K1 – Driver 1 information (card in slot 1)

K2 – Driver 2 information (card in slot 2)

MSB	1	1	KK1	KK0	CZ3	CZ2	CZ1	CZ0	LSB

KK1:KK0 – driver card

- b'00' – no card in slot.
- b'01' – card in slot.
- b’10’ – invalid data.

CZ3:CZ0 – driver time related states (4 bits)

- b'0000' – normal/no limits reached
- b'0001' – 15 min before 4½ h
- b'0010' – 4½h reached
- b'0011' – 15 min before 9h
- b’0100’ – 9h reached
- b’0101’ – 15 minutes before 16h (not having 8h rest during the last 24h)
- b’0110’ – 16h reached
- b'0111' – weekly driving time pre-warning active
- b'1000' – weekly driving time warning active
- b'1001' – 2 weeks driving time pre-warning active
- b'1010' – 2 weeks driving time warning active
- b'1011' – driver 1 card expiry warning active
- b'1100' – next mandatory driver 1 card download warning active
- b'1101' – other
- b’1110’ – Invalid data

I – tachograph other information

MSB	F1	F0	P1	P0	K1	K0	R1	R0	LSB

F1:F0 – ferry/train crossing condition

- b'00' – normal operation.
- b’01’ – ferry/train crossing condition enabled.
- b’10’, b’11’ – invalid data.

R1:R0 – vehicle motion

- b'00' – vehicle motion not detected.
- b’01’ – vehicle motion detected.
- b’10’, b’11’ – invalid data.

K1:K0 – direction indicator

- b’00’ – forward.
- b’01’ – reverse.
- B’10’, b’11’ – invalid data.

P1:P0 – vehicle overspeed (it indicates whether the vehicle is exceeding the legal speed limit set in the tachograph)

- b'00' – no overspeed
- b’01’ – overspeed
- b’10’, b’11’ – invalid data

✧ <*Detailed Information / Indicators*>: A hexadecimal number. Each bit contains information of one indicator.

- Bit 0: FL – fuel low indicator (1 – indicator on, 0 – indicator off)
- Bit 1: DS – driver seatbelt indicator (1 – indicator on, 0 – indicator off)
- Bit 2: AC – air conditioning (1 – on, 0 - off)
- Bit 3: CC – cruise control (1 – active, 0 - disabled)
- Bit 4: B – brake pedal (1 – pressed, 0 – released)
- Bit 5: C – clutch pedal (1 – pressed, 0 – released)
- Bit 6: H – handbrake (1 – pulled-up, 0 – released)
- Bit 7: CL – central lock (1 – locked, 0 – unlocked)
- Bit 8: R – reverse gear (1 – on, 0 – off)
- Bit 9: RL – running lights (1 – on, 0 – off)
- Bit 10: LB – low beams (1 – on, 0 – off)
- Bit 11: HB – high beams (1 – on, 0 – off)
- Bit 12: RFL – rear fog lights (1 – on, 0 – off)
- Bit 13: FFL – front fog lights (1 – on, 0 – off)
- Bit 14: D – doors (1 – any door opened, 0 – all doors closed)
- Bit 15: T – trunk (1 – opened, 0 – closed)

✧ <*Lights*>: A hexadecimal number. Each bit contains information of one type of light.

- Bit 0: Running Lights (1 – on, 0 – off)
- Bit 1: Low Beam (1 – on, 0 – off
- Bit 2: High Beam (1 – on, 0 – off)
- Bit 3: Front Fog Light (1 – on, 0 – off)
- Bit 4: Rear Fog Light (1 – on, 0 – off
- Bit 5: Hazard Lights (1 – on, 0 – off)

- Bit 6: Reserved
- Bit 7: Reserved

✧ <*Doors*>: A hexadecimal number. Each bit contains information of one door.

- Bit 0: Driver Door (1 – opened, 0 – closed)
- Bit 1: Passenger Door (1 – opened, 0 – closed)
- Bit 2: Rear Left Door (1 – opened, 0 – closed)
- Bit 3: Rear Right Door (1 – opened, 0 – closed)
- Bit 4: Trunk (1 – opened, 0 – closed)
- Bit 5: Hood (1 – opened, 0 – closed)
- Bit 6: Reserved
- Bit 7: Reserved

✧ <*Total Vehicle Overspeed Time*>: The total time when the vehicle speed is greater than the limit defined in CAN100's configuration.

✧ <*Total Vehicle Engine Overspeed Time*>: The total time when the vehicle engine speed is greater than the limit defined in CAN100's configuration.

✧ <*Ad-Blue Level*>: The level of Ad-Blue.

✧ <*Axle Weight 1st*>: Vehicle first axle weight. The unit is Kg.

✧ <*Axle Weight 3rd*>: Vehicle third axle weight. The unit is Kg.

✧ <*Axle Weight 4th*>: Vehicle fourth axle weight. The unit is Kg.

✧ <*Tachograph Overspeed Signal*>: Vehicle overspeed signal from the tachograph.

- 0: Overspeed is not detected.
- 1: Overspeed is detected.

✧ <*Tachograph Vehicle Motion Signal*>: The vehicle motion signal in the tachograph.

- 0: Motion is not detected
- 1: Motion is detected.

✧ <*Tachograph Driving Direction*>: Vehicle driving direction from the tachograph.

- 0: Driving forward.
- 1: Driving backward.

✧ <*Analog Input Value*>: The value of analog input. The unit is mV.

✧ <*Rapid Brakings*>: The count of rapid brakings of the vehicle.

✧ <*Engine Braking Factor*>: It measures how often driver brakes with brake pedal or with engine and stores both counts (always increasing). Decreasing speed with no pedal pressed causes an increase in engine braking factor.

✧ <*Pedal Braking Factor*>: It measures how often driver brakes with brake pedal or with engine and stores both counts (which are always increasing). Decreasing speed with brake pedal pressed causes an increase in pedal braking factor.

✧ <*Total Accelerator Kick-downs*>: The count of accelerator pedal kick-downs (with the pedal pressed over 90%).

✧ <*Total Effective Engine Speed Time*>: Total time when the vehicle engine speed is effective. The unit is h.

✧ <*Total Cruise Control Time*>: Total time when vehicle speed is controlled by cruise-control module. The unit is h.

✧ <*Total Accelerator Kick-down Time*>: Total time when accelerator pedal is pressed over 90%. The unit is h.

- <*Total Brake Applications*>: The total number of braking processes initiated by brake pedal.
- <*Tachograph Driver 1 Card Number*>: The card number of tachograph driver 1.
- <*Tachograph Driver 2 Card Number*>: The card number of tachograph driver 2.
- <*Tachograph Driver 1 Name*>: The name of tachograph driver 1.
- <*Tachograph Driver 2 Name*>: The name of tachograph driver 2.
- <*Registration Number*>: The vehicle registration number.
- <*Expansion Information*>: A hexadecimal number. Each bit contains information of one indicator.
    - Bit 0: W – webasto (1 – on, 0 – off or not available)
    - Bit 1: BFL – brake fluid low indicator (1 – on, 0 – off or not available)
    - Bit 2: CLL – coolant level low indicator (1 – on, 0 – off or not available)
    - Bit 3: BAT – battery indicator (1 – on, 0 – off or not available)
    - Bit 4: BF – brake system failure indicator (1 – on, 0 – off or not available)
    - Bit 5: OP – oil pressure indicator (1 – on, 0 – off or not available)
    - Bit 6: EH – engine hot indicator (1 – on, 0 – off or not available)
    - Bit 7: ABS – ABS failure indicator (1 – on, 0 – off or not available)
    - Bit 8: EPS – EPS failure indicator (1 – on, 0 – off or not available)
    - Bit 9: CHK – “check engine” indicator (1 – on, 0 – off or not available)
    - Bit 10: AIR – airbag indicator (1 – on, 0 – off or not available)
    - Bit 11: SC – service call indicator (1 – on, 0 – off or not available)
    - Bit 12: OLL – oil level low indicator (1 – on, 0 – off or not available)
    - Bit 13: CHG –battery charging for electric cars (1 - battery is being charged, 0 - no charging)
    - Bit 14： FS –fuel source - for vehicles equipped with factory gas installation (1 - engine powered by gas, 0 - engine powered by petrol)
- <*Rapid Brakings*>: The number of total rapid brakings since installation (calculation based on CAN 100 settings of speed decrease time and value).
- <*Rapid Accelerations*>: The number of total rapid accelerations since installation (calculation based on CAN 100 settings of speed increase time and value).
- <*Engine Torque*>: The engine torque. Unit: percentage.
- <*Ambient Temperature*>: A numerical value is used to indicate the ambient temperature.
- <*DTC*>: Diagnostic trouble codes read from the vehicle. The protocol is OBD II/SAE J2012. Each diagnostic trouble code is a 3-byte element in following format:

Byte m									Byte m+1								Byte m+2							
7	6	5	4	3	2	1	0		7	6	5	4	3	2	1	0	7	6	5	4	3	2	1	0
C1		C2		C3					C4				C5				-	-	-	-	-	T	P	C

- C1 - first DTC character
  b’00’ - P - powertrain
  b’01’ - C - chassis
  b’10’ - B - body
  b’11’ - U - network
- C2 - second DTC character (digit 0 to 3)
- C3, C4, C5 - consecutive DTC characters (hexadecimal digits 0 to F)

- T - DTC status flag: permanent (stored into non-volatile memory)
- P - DTC status flag: pending (detected during current or last driving cycle)
- C - DTC status flag: confirmed (stored)

  Each code may have one or multiple status flags set.

  E.g.

  0x02 0x2E 0x03 is a code P022E with status pending and confirmed.

  0x61 0x99 0x02 is a code C2199 with status pending.

✧ <*Gaseous Fuel Level*>: The alternative fuel levels. (when gas installation, i.e. LPG, is factory equipment and information is provided by vehicle). The unit is liter (L) or percentage (P).

✧ <*Retarder Usage*>: The unit is percentage.

✧ <*Power Mode*>: Power mode.

MSB	R	R	PTO1	PTO0	R	R	R	R	LSB

R – Reserved for future use (set to 1)

PTO1:PTO0 – Power Take-Off

- b'00' – PTO not engaged
- b'01' – PTO engaged
- b'10' – unknown state of PTO (not compliant with FMS 3.0 standard)
- b'11' – parameter currently not available

✧ <*Tacho Timestamp*>: Real time clock is a date and time displayed on the car's dashboard, usually read from tachograph.

✧ <*Battery Level*>: The battery charge level for electric vehicles. The unit is percentage (P).

✧ <*Charging States*>: The status of battery charging and Charging cable connected in electric cars.

- 0x00: Plug disconnected
- 0x01: Plug connected, not charging
- 0x02: Connecting (plug connected, but charging not started yet)
- 0x03: Charging in progress
- 0x04: Charging failure

✧ <*Battery Instantaneous Voltage*>: For electric cars this parameter stands for instantaneous high voltage of battery cells (read from BMS). The unit is voltage (V).

✧ <*Battery Charging Cycles Count*>: For electric cars this parameter counts cycles of battery charging (increments at every finished cycle of charging). The unit is cycle.

✧ <*Total Energy Recuperated*>: Sum of energy transmitted to battery with no charger connected. The unit is Wh.

✧ <*Battery Temperature*>: A numerical value is used to indicate the battery temperature.

✧ <*Battery Charging Current*>: A numerical value is used to indicate the electric car's battery charging current. The unit is ampere.

✧ <*Battery Instantaneous Power*>: For electric cars, this parameter stands for instantaneous power used by (positive values) or recuperated from (negative values) the car. The unit is W.

✧ <*Battery State of Health (SoH)*>: For electric cars, this parameter stands for battery general condition (100% means brand new, 0% totally damaged).

✧ <*Total Energy Used*>: Sum of energy used by car's engine and equipment; recuperated energy does not affect this parameter. The unit is Wh.

✧ <*Total Energy Used When Idling*>: Sum of energy used by car's engine and equipment with

vehicle speed 0 km/h; recuperated energy does not affect this parameter. The unit is Wh.

✧ <*Total Energy Charged*>: Sum of energy transmitted to battery from external charger. The unit is Wh.

2.3.10.2. +RESP:GTACN

If the <*Tacho Report Mask*> and <*Tacho Report Interval*> are enabled by the command **AT+GTCAN**, the device will send the additional information via the message **+RESP:GTACN** to the backend server periodically.

➢ **+RESP:GTACN,**

Example: +RESP:GTACN,BD0218,866775051616928,,0,0,000F,0,2F3F,queclink01,queclink02,20230412064955,309D$			
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	<=2	0 – 4	
CANBUS Device State	1	0|1	
Tacho Report Mask	<=8	0 – FFFFFFFF	
Ignition State	1	0|1	
Tachograph Information	4	00 – FFFF	
Tachograph Driver 1 Card Number	<=40	ASCII	
Tachograph Driver 2 Card Number	<=40	ASCII	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

✧ <*Report Type*>: It indicates the type of report.

- 0: Periodic report.
- 1: Reserved.
- 2: Ignition event report.
- 3: Tachograph Driver Card ID changed event report.
- 4: Tachograph Driver working status or “Out of Scope” condition changed event

report.

✧ <*CANBUS Device State*>: A numeral to indicate the communication state with the external CANBUS device.

- 0: Abnormal. It fails to receive data from the external CANBUS device.
- 1: Normal. It is able to receive data from the external CANBUS device.

✧ <*Tacho Report Mask*>: Please refer to <*Tacho Report Mask*> in **AT+GTCAN**.

✧ <*Ignition State*>: A numeral to indicate the ignition status.

- 0: Ignition off.
- 1: Ignition on.

✧ <*Tachograph Information*>: Two bytes. The high byte describes driver 2, while the low byte describes driver 1.

Each byte format:

V	R	W1	W0	C	T2	T1	T0

V: Validity mark (0 – valid driver data, 1 – no valid data)

R: Reserved

C: Driver card (1 – card inserted, 0 – no card inserted)

T2-T0: Driving time related states:

- 0: Normal / no limits reached.
- 1: 15min before 4½h.
- 2: 4½h reached.
- 3: 15min before 9h.
- 4: 9h reached.
- 5: 15 minutes before 16h (without 8h rest during the last 24h).
- 6: 16 h reached.
- 7: Other limit.

W1-W0: Driver working states:

- 0: Rest - sleeping.
- 1: Driver available – short break.
- 2: Work – loading, unloading, working in an office.
- 3: Drive – behind the wheel.

✧ <*Tachograph Driver 1 Card Number*>: The card number of tachograph driver 1.

✧ <*Tachograph Driver 2 Card Number*>: The card number of tachograph driver 2.

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+GTODP
+ACK:GTODP
AT+GTDIS
+ACK:GTDIS
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+GTCAN
+ACK:GTCAN
AT+GTCLT
+ACK:GTCLT
AT+GTCFU
+ACK:GTCFU
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:GTFRI
  +RESP:GTLBC

- **Device Information Report**

  +RESP:GTOSI

- **CANBUS Device Information Report**

  +RESP:GTCAN

- **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:GTRMD
+RESP:GTGSS
+RESP:GTCRA
+RESP:GTUPC
+RESP:GTEUC
+RESP:GTASC
+RESP:GTOSP
+RESP:GTODP
+RESP:GTDSS
+RESP:GTDAR
+RESP:GTCLT
+RESP:GTHBM
+RESP:GTSOS
+RESP:GTBTN

- **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
A1	Forward Collision Warning
A2	Pedestrian Collision Warning
A3	Headway Monitoring Warning
E0	RS232 Camera (ID = 0) Picture File Type
E1	RS232 Camera (ID = 1) Picture File Type
E2	RS232 Camera (ID = 2) Picture File Type
E3	RS232 Camera (ID = 3) Picture File Type
F0	Manual Record (RTO-VDO, PIC, Take Video |Picture From Video File By Time)
F1	SOD Time Range Record File
F2	RTO-PIC Take Picture Right Now
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.
D8	Seatbelt unfastened detection.

Appendix C: Accessory Index

Accessory Model Name	Accessory Type	Accessory Model	Alarm Type	Append Mask
Escort_Fuel_BLE	1	0	0	001F
DTH100 (WMS301)	6	4	0 – 3|7 – 9|13 – 14	203F
WRL300	13	0	15	4007
ATP100/ATP102	12	0	0|E – 10	0617

Appendix D: File Name Definition

<YYYYMMDD>	UTC time of the year, month and day
<hh>	UTC time of the hour. The value can be 00,01,02,... 23
<mm>	UTC time of the minute. The value can be 00,01,02,... 59
<ss>	UTC time of the second. The value can be 00,01,02,... 59
<tt>	Associated event type (Appendix B: Event Code – Recording Type)
<c>	Identify which camera the file came from (1: channel 1; 2: channel 2)

For Picture File Name: YYYYMMDD_hhmmss_tt_c.jpg (e.g: 20231204_051634_01_1.jpg)
For Video File Name: YYYYMMDD_hhmmss_tt_c.mp4 (e.g: 20121204_051634_01_2.mp4)